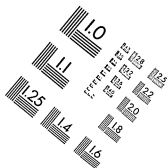


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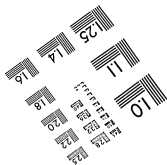
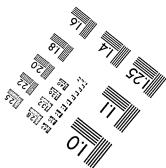
MS303-1980



Centimeter



Inches



# Thomas A Edison Papers

A SELECTIVE MICROFILM EDITION

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(1850-1878)

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The pages which were microfilmed for this collection are in generally good condition in the original. There are some pages, however, which due to age are lighter than normal. Additionally, because some volumes are very large and have been bound tightly and cannot be unbound, there are intermittent occurrences of slight distortion of the edges of a small percentage of the pages. We have made every technical effort to ensure complete legibility of each and every page.

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The fifteen books in this series cover the years 1870-1880. All but two relate to Edison's work in Newark (1870-1876). The Newark books consist primarily of experimental notes and drawings on telegraphy.

There are also mechanics' drawings for the production of telegraph equipment at the Newark shops, miscellaneous financial records, and documents relating to the telegraph industry. Among the latter are newspaper clippings on business and technological matters, forms used by the telegraph companies, and price lists and advertising materials. These books also contain some material on the electric pen, etheric force, and other electrical technologies. The final two books in this series date from the Menlo Park period. One consists of pasted-in notes and drawings on electric lighting covering the period October 1877 - December 1880. The other contains notes and acoustic recordings from an investigation of noise on the Metropolitan Elevated Railroad during the summer of 1878, along with notes and drawings of the aurophone and megaphone. The following books comprise this series:

Cat. 298	(Disbound Scrapbook, 1870-1871)
Cat. 30,094	(Bound Notebook, 1871-1875)
Cat. 297	(Disbound Scrapbook, 1871-1875)
Cat. 30,099	(Bound Notebook, ca. 1872-1874)
Cat. 1176	(Bound Notebook, 1873-1874)
Cat. 299	(Bound Scrapbook, 1873)
Cat. 1175	(Bound Notebook, 1873-1874)
Cat. 1171	(Bound Notebook, 1873-1874)
Cat. 1170	(Bound Notebook, 1873-1877)
Cat. 1168	(Bound Scrapbook, 1874-1876)
Cat. 30,095	(Bound Notebook, 1874-1875)
Cat. 1169	(Bound Notebook, 1875-1876)
Cat. 30,100	(Scrapbook Fragment, 1875)
Cat. 1146	(Bound Scrapbook, 1877-1880)
Cat. 30,101	(Bound Notebook, 1878)

Laboratory Scrapbook, Cat. 298

This scrapbook consists primarily of drawings and contains only a few dated items, covering the period July 1870-September 1871. Some of the drawings are by Edison; others were probably done by draftsmen and mechanics at the American Telegraph Works. The drawings are mostly of telegraph apparatus and range from formal full-scale drafts to rough sketches on scraps of paper. Some of the drawings have been cut out as patterns, possibly for use in the construction of apparatus. There is also a plan of a building and numerous clippings of patent specifications and drawings from the reports of the patent commissioner between 1857 and 1859. (Additional clippings for 1860-1868 can be found in Cat. 1177, Miscellaneous Scrapbook Series.) There is also some business-related material, including advertising circulars, two payroll accounts for January and February 1871, and one account sheet for the firm of Edison & Unger, dated September 13, 1871. The cover is marked "S."

The book contains 215 numbered pages. It has been disbound, and most items have been removed from their scrapbook pages to allow for filming. The scrapbook page number has been filmed below each document.

Blank pages not filmed: 41-42, 136, 144-157, 161, 164-165, 168-171, 174-175, 178-181, 184-185, 188-192, 194-195, 197-215.

Scrap Book Vol 3

Edison & Unger. Newark 1871

Patrolship figures - Sept. 13, 1871

Sketches & Drawings

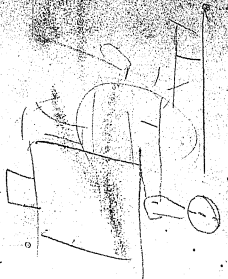
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1

*Handwritten notes*



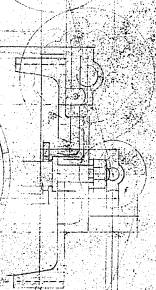
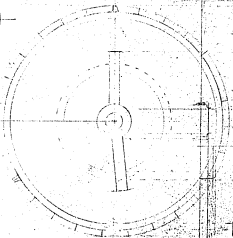
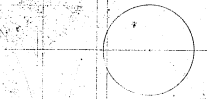
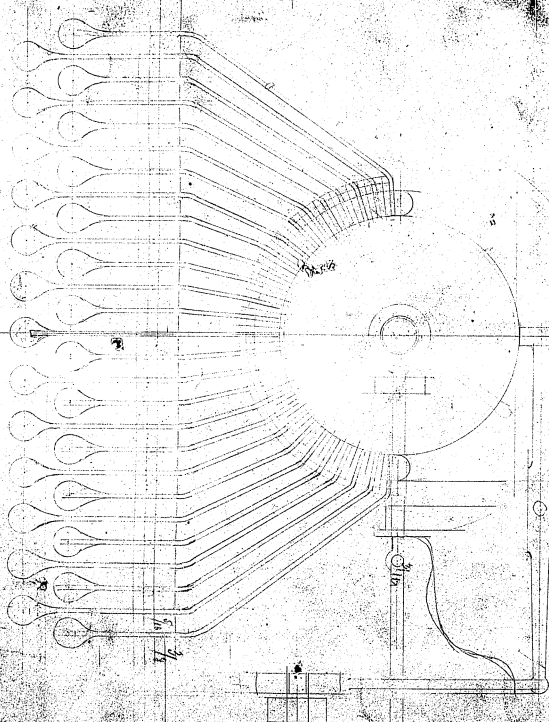
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*Handwritten notes*

*Handwritten notes*

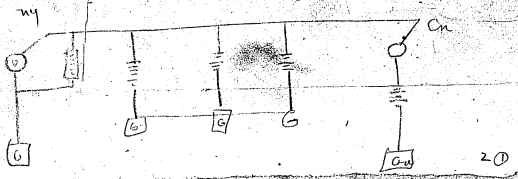
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*Handwritten notes*

*Handwritten notes*

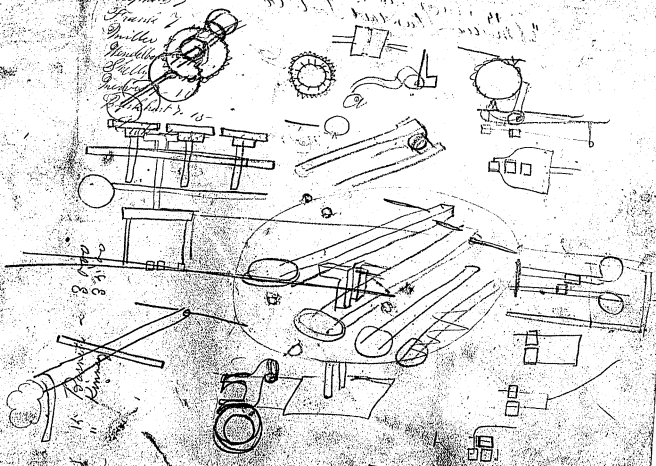
1705



Diameter of Cylinder 604  
 Gauge 1897  
 Thickness of this wire 152 mm  
 Width of Springs 2 inch  
 Depth 3/8

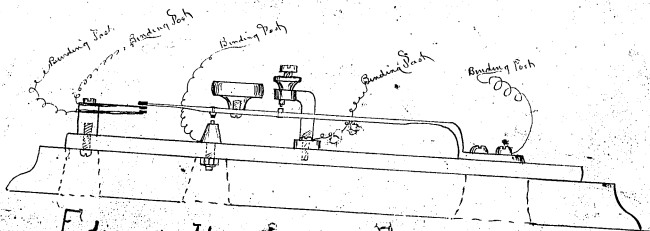
20

Charles?  
 Perry?  
 Stephens?  
 Francis?  
 Spiller  
 Goullin  
 Halls  
 Mackay  
 Phillips?  
 18-



2

# Key for Testing Printers



Edison & Unger

Newark N.J.

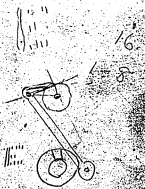
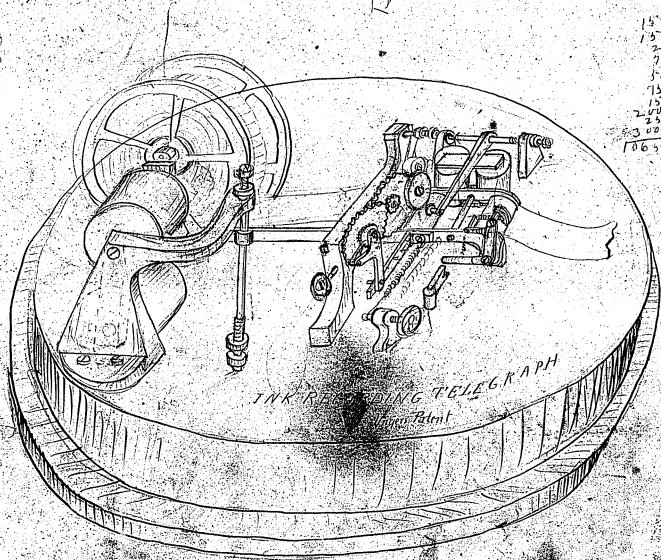
Key for Test



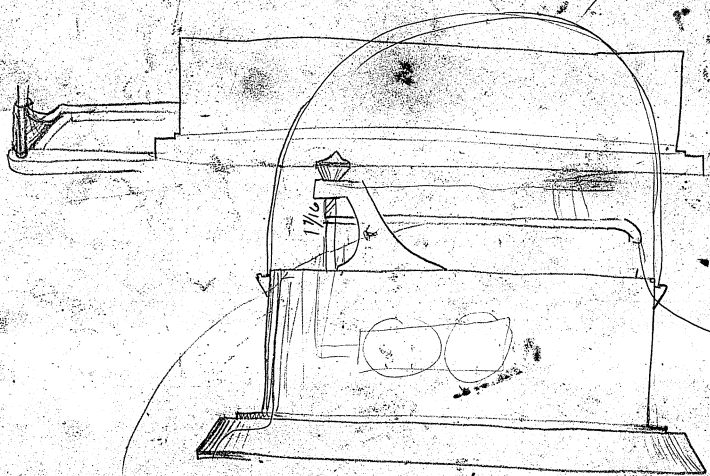
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 14000  
 1600  
 300  
 480000

300  
 500  
 150000.00

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 25  
 75  
 50  
 75  
 200  
 25  
 5300  
 1065







2.00  
17/7





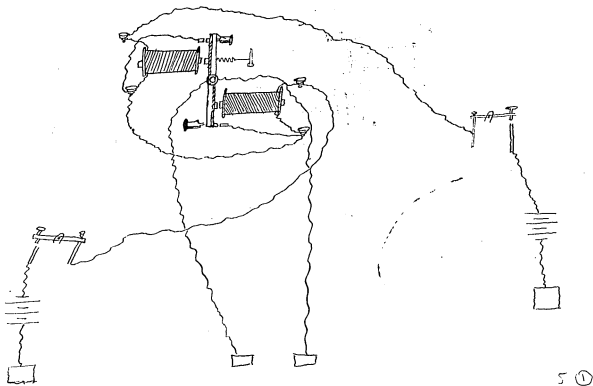
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12 3

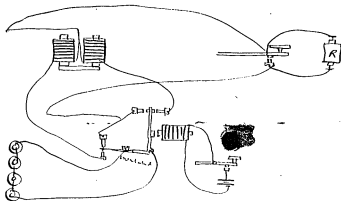
398 14-14  
1/2  
13-14

4

Repeater



Brown  
Try this. one Battery

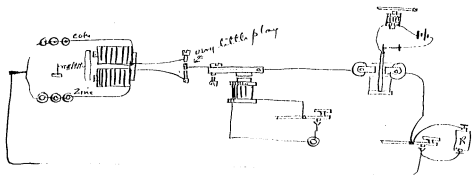


5

Brown

Try it this way

Keep memorandum how  
it work a



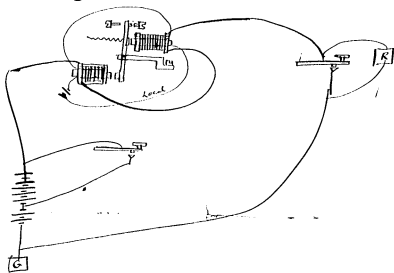
wound opposite, so that one  
battery will go around the  
wound in the same direction  
as the other

I cant get the circuiting right on secondary but what  
it will draw current out when I close key it works  
to me in the correct direction it will still work in  
distasteful key to me to adjust wrong key in relay  
when key is then used with same battery  
is better in order to make it work  
to be sure of getting some of it

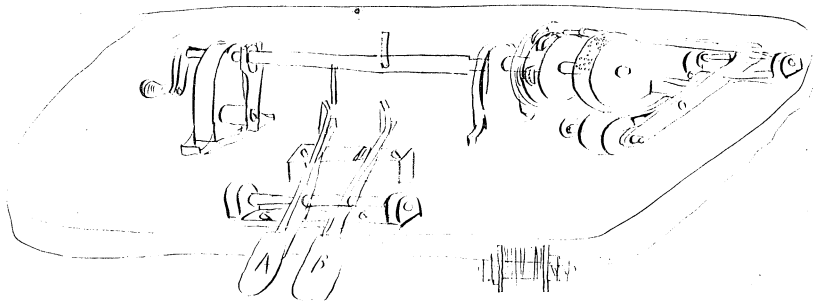
5  
⑤

Brown

Try this



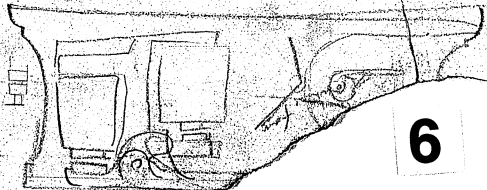
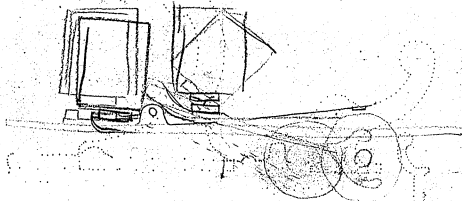
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5

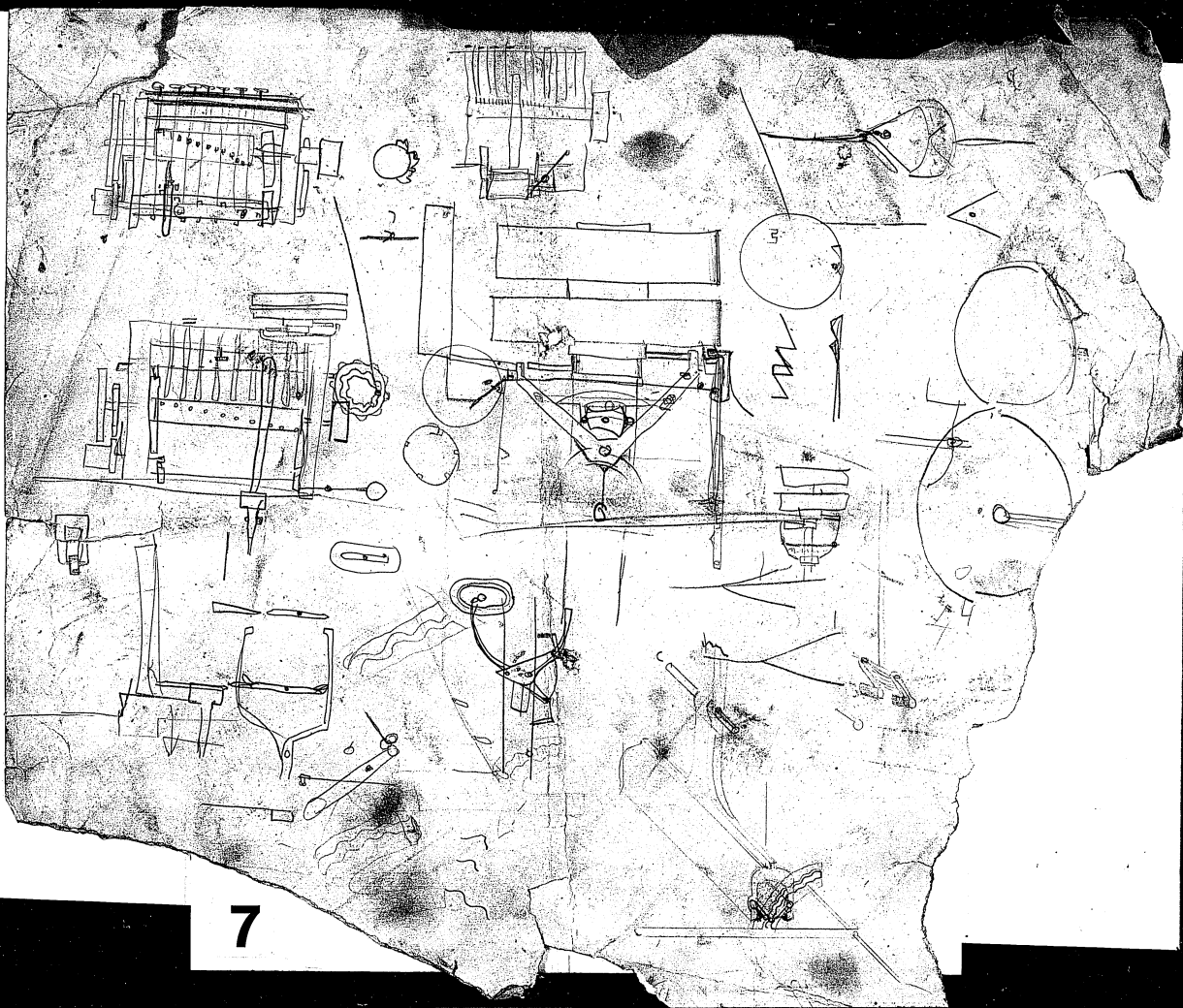


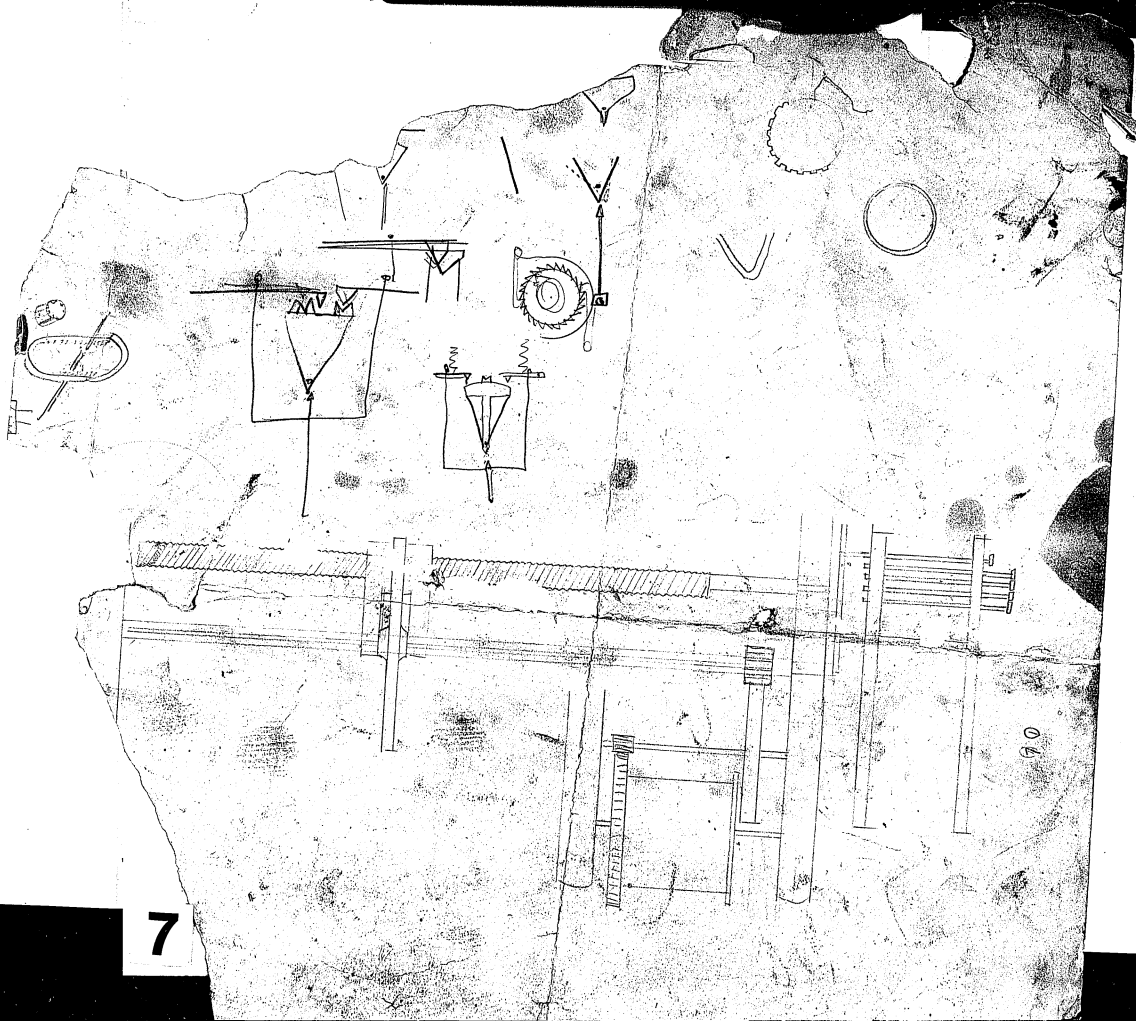
09



6

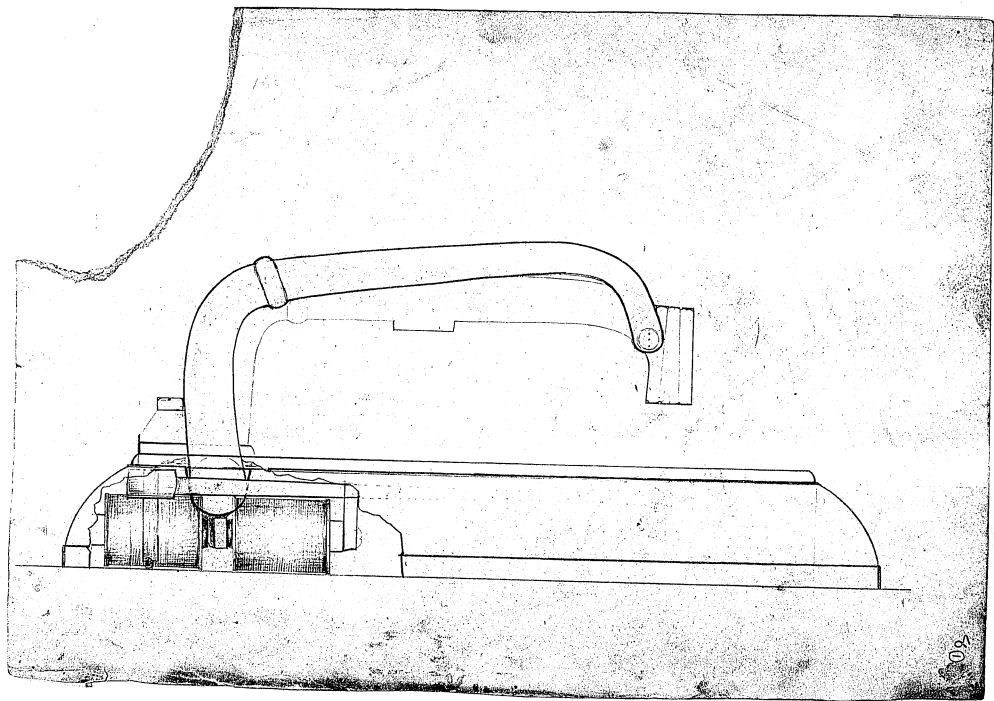






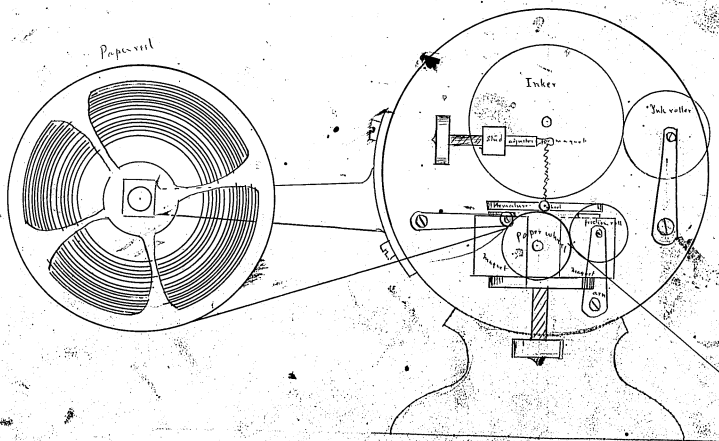
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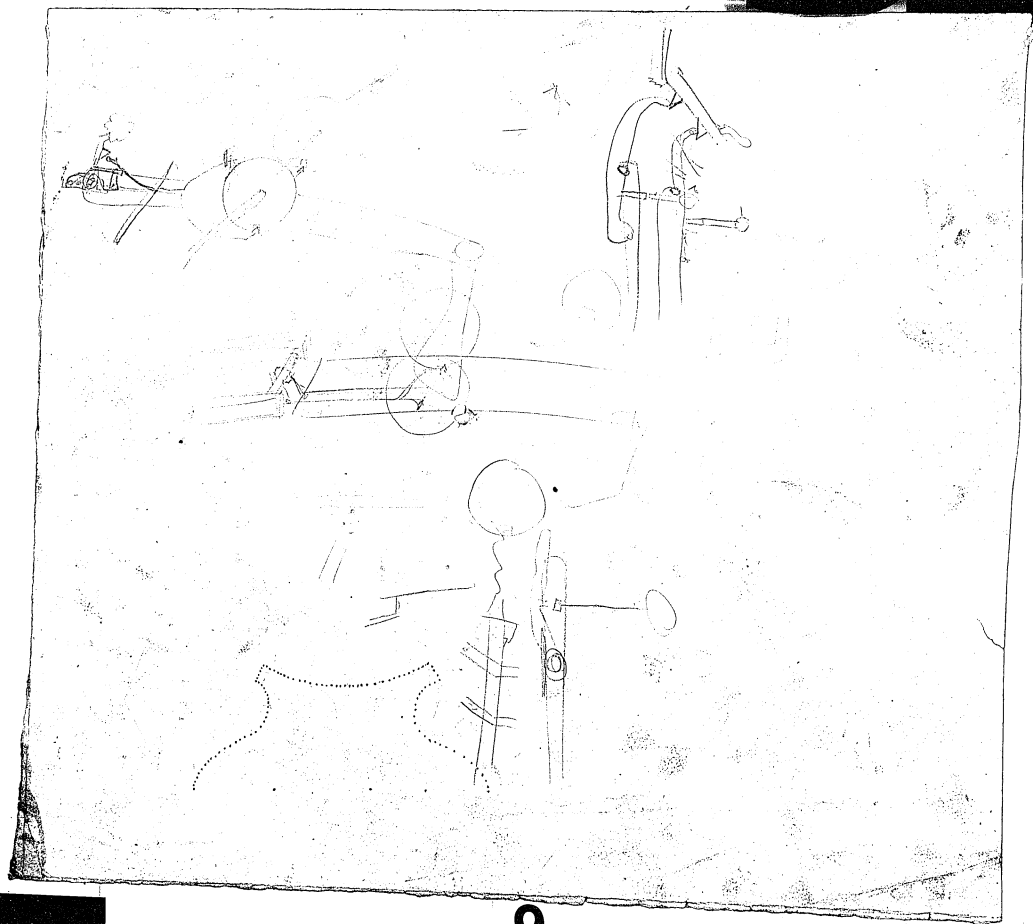
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8

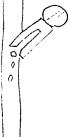
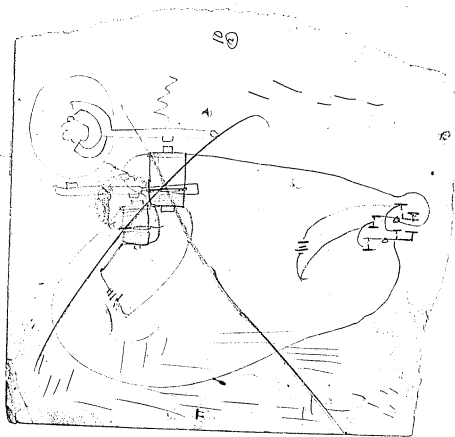
Front View ink Recorder





$\frac{1}{2}$  inch  
 $\frac{1}{8}$  inch

10

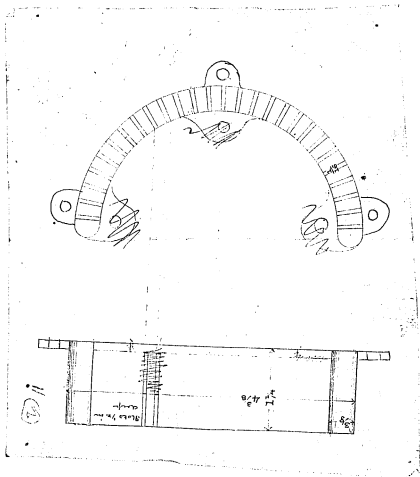


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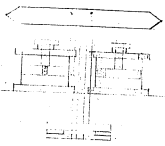




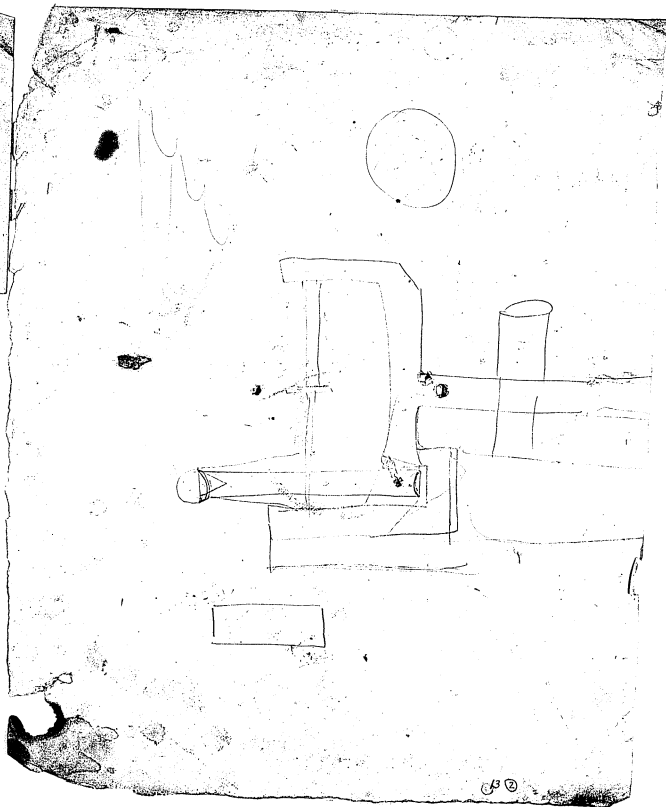


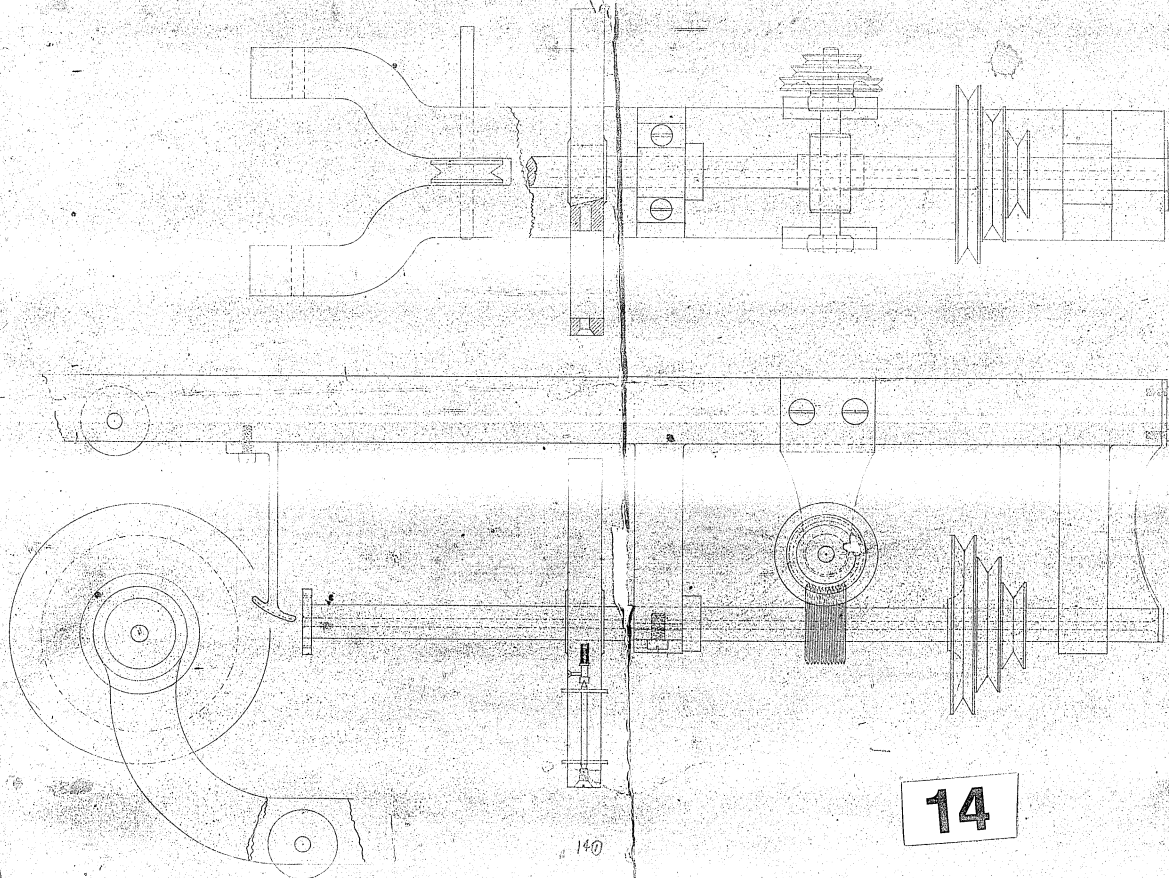
11

How to this



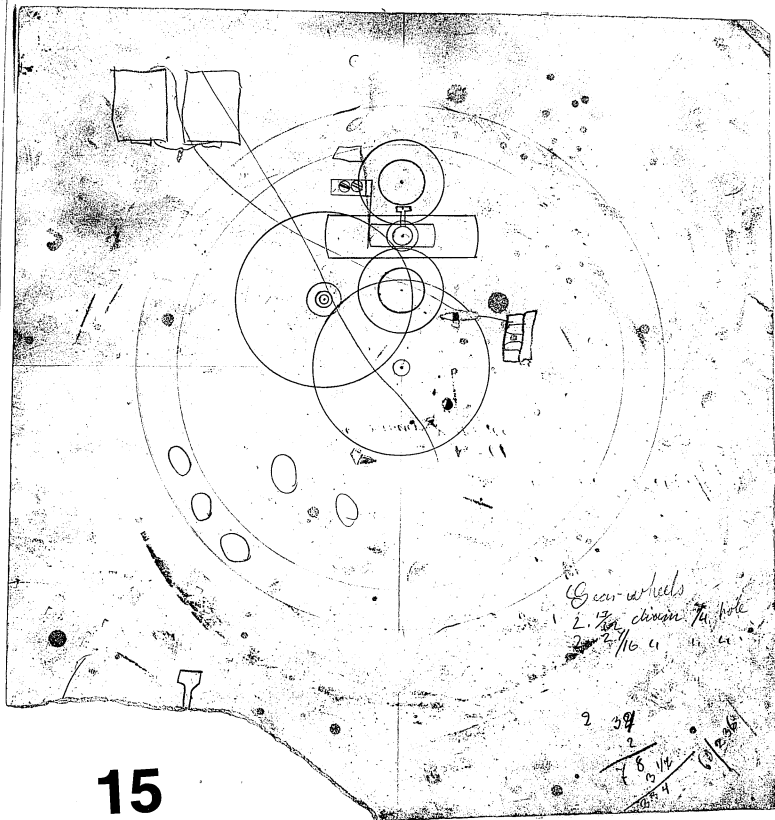
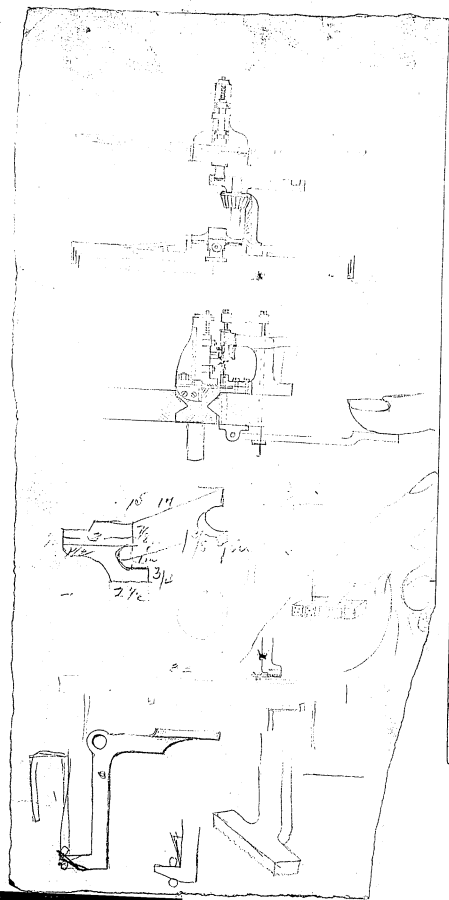




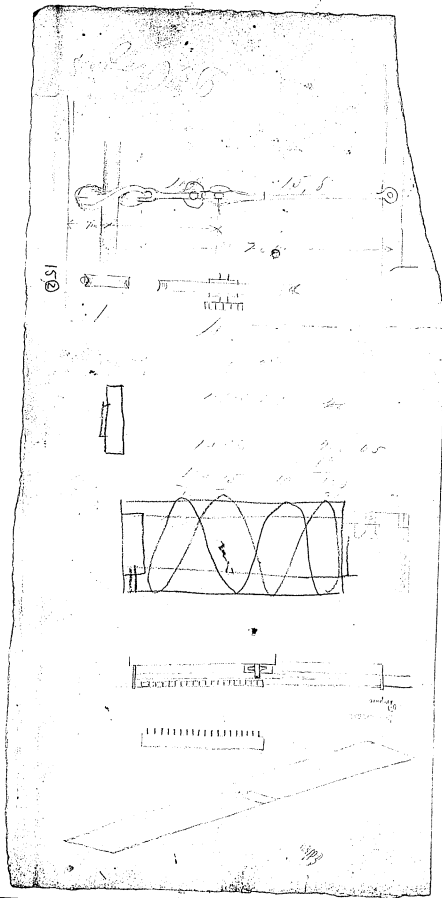


140

14



15



15

Fig 50

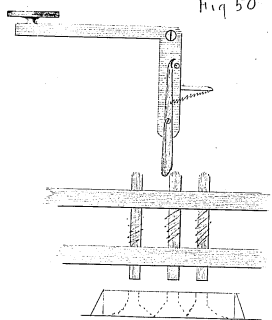


Fig 12

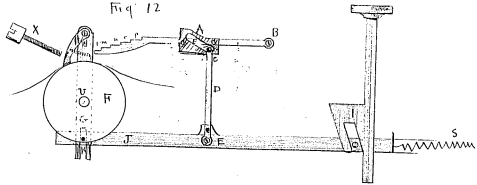
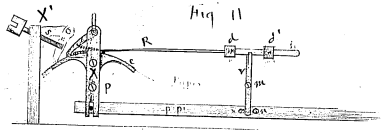


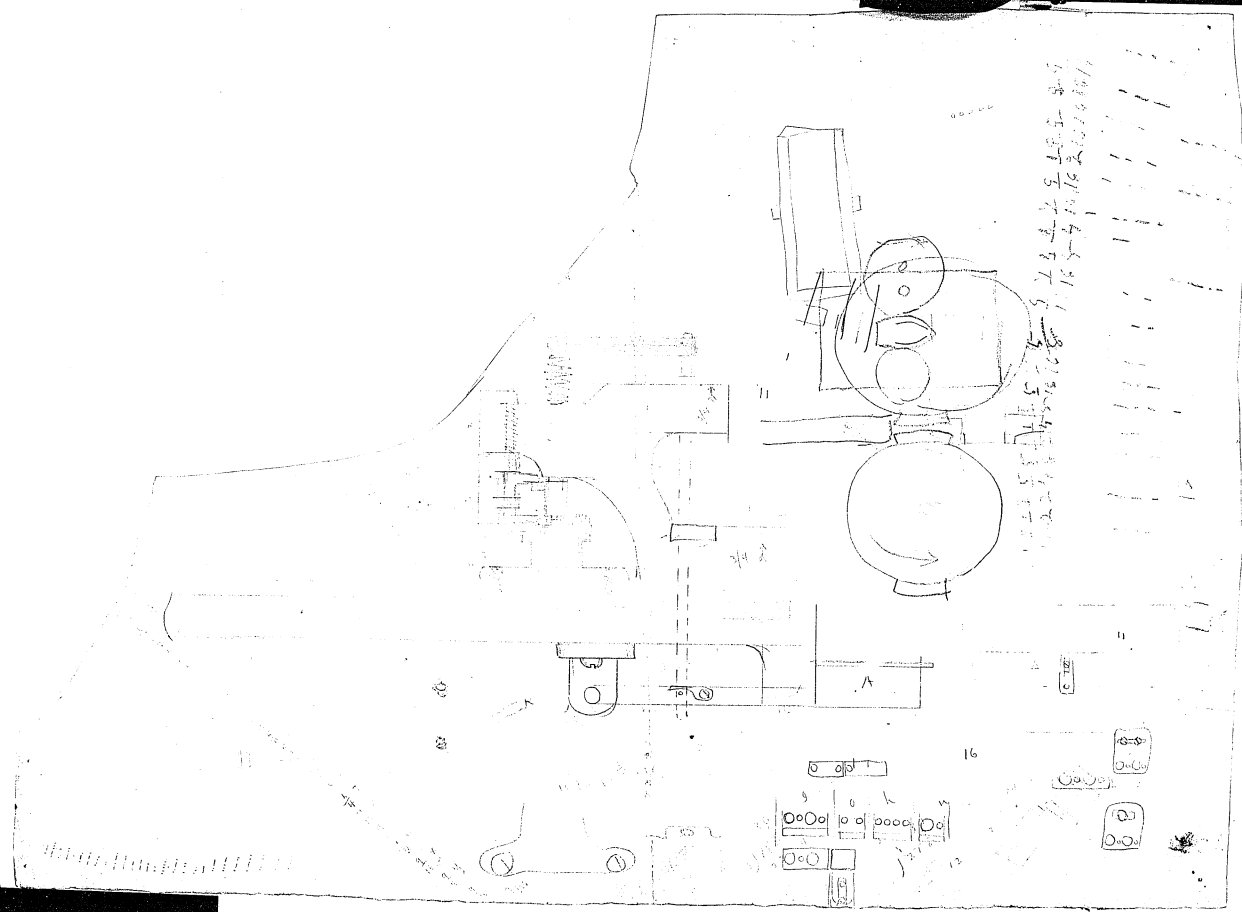
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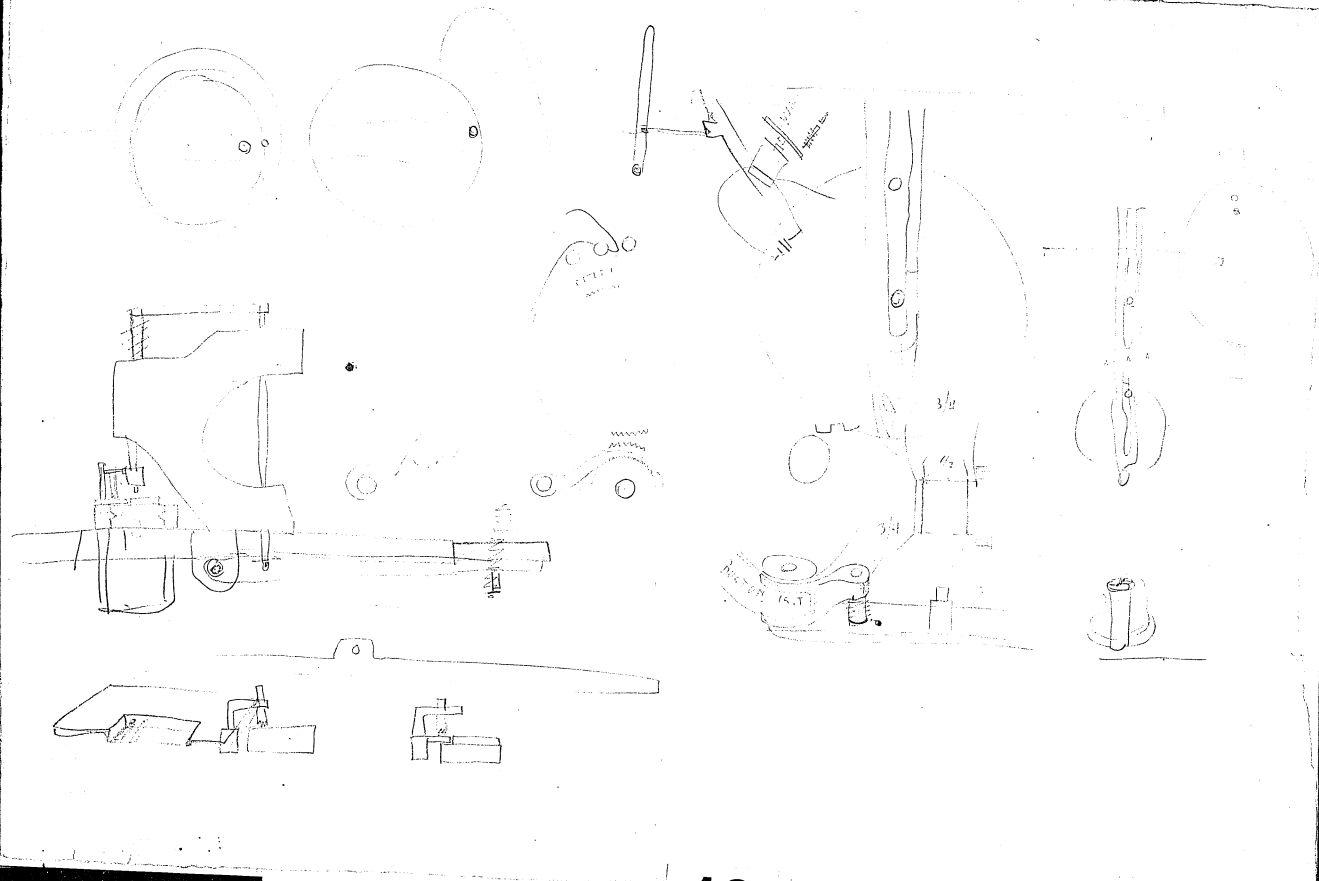


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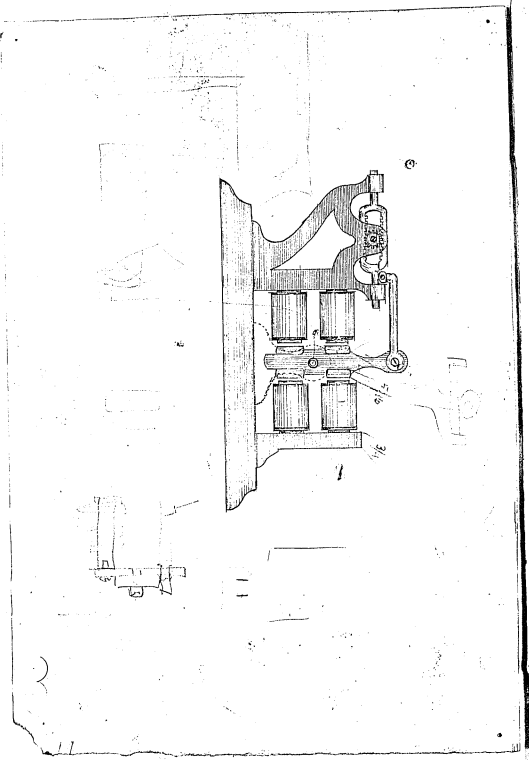
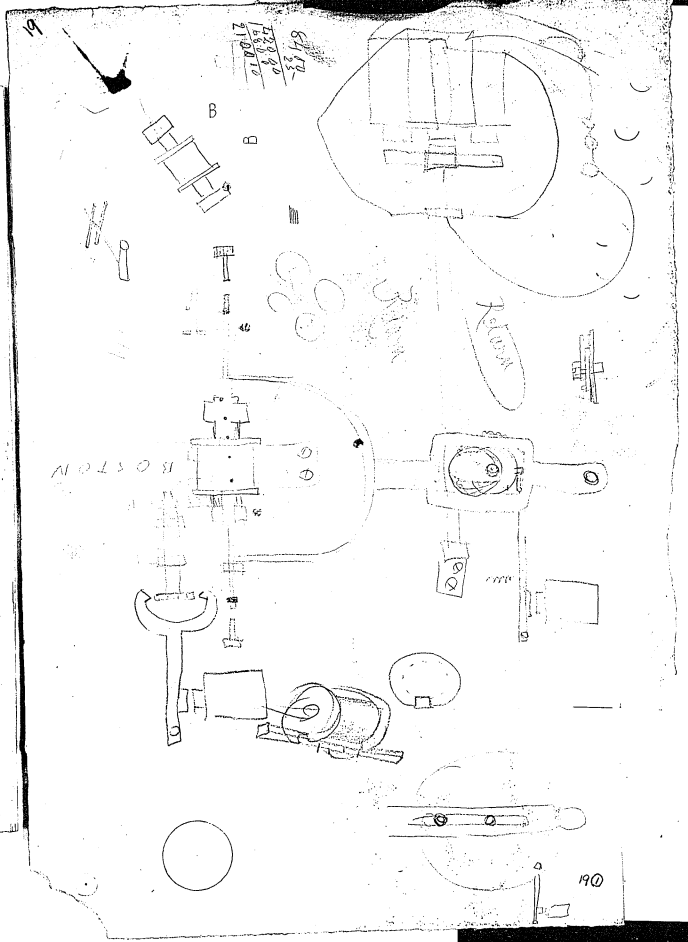






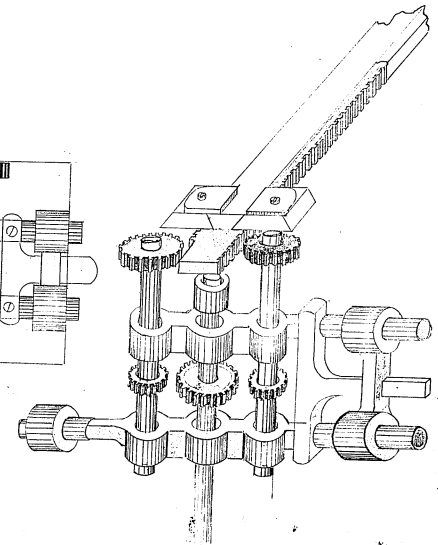
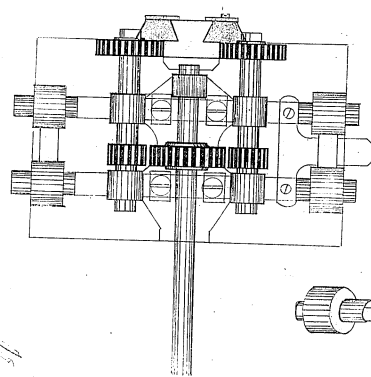
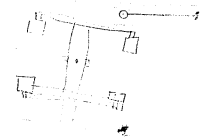
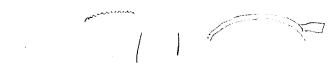


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1333  
210072



19





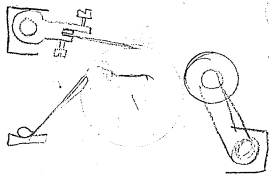


Mahogany base: 2 1/2 long

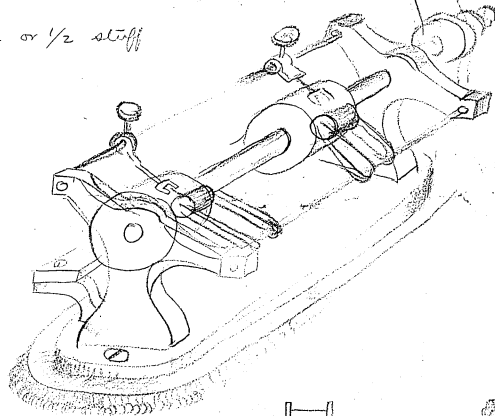
\* each 1/4 or 1/2 stiff



Power Transmitter  
\* 5 Wheels



diff. for  
guide + frame



Diff

No 1



Plain

No 2



Wheels

No 3



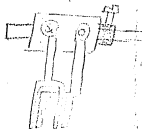
Plain

No 4

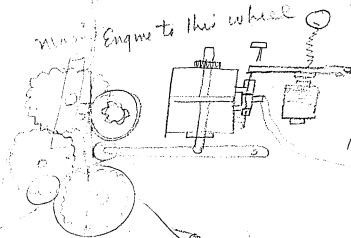


Wheel

No 5



main Engine to this wheel



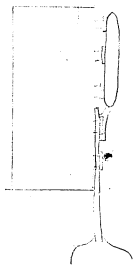
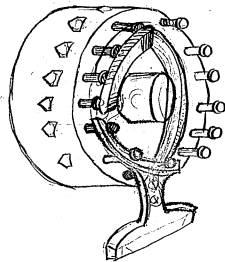
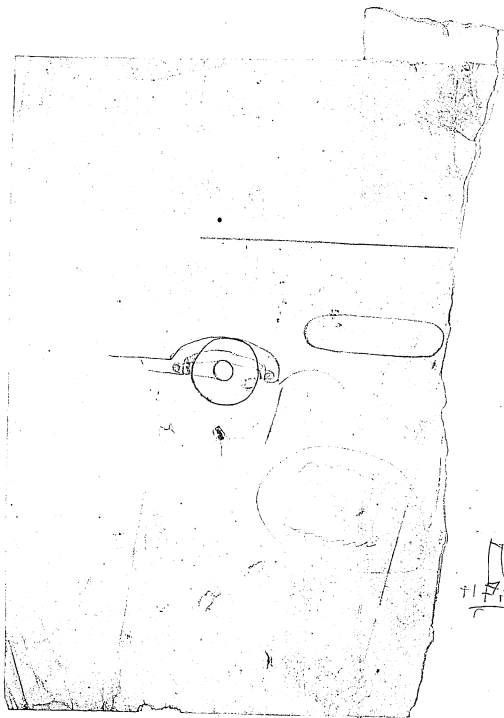
Rubber paper for air

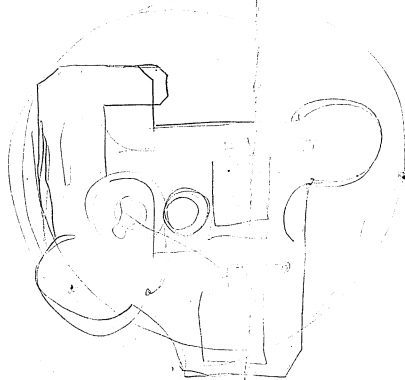
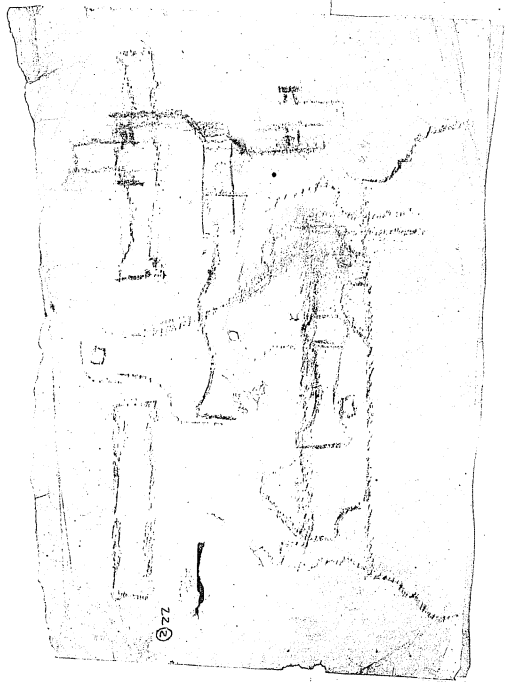


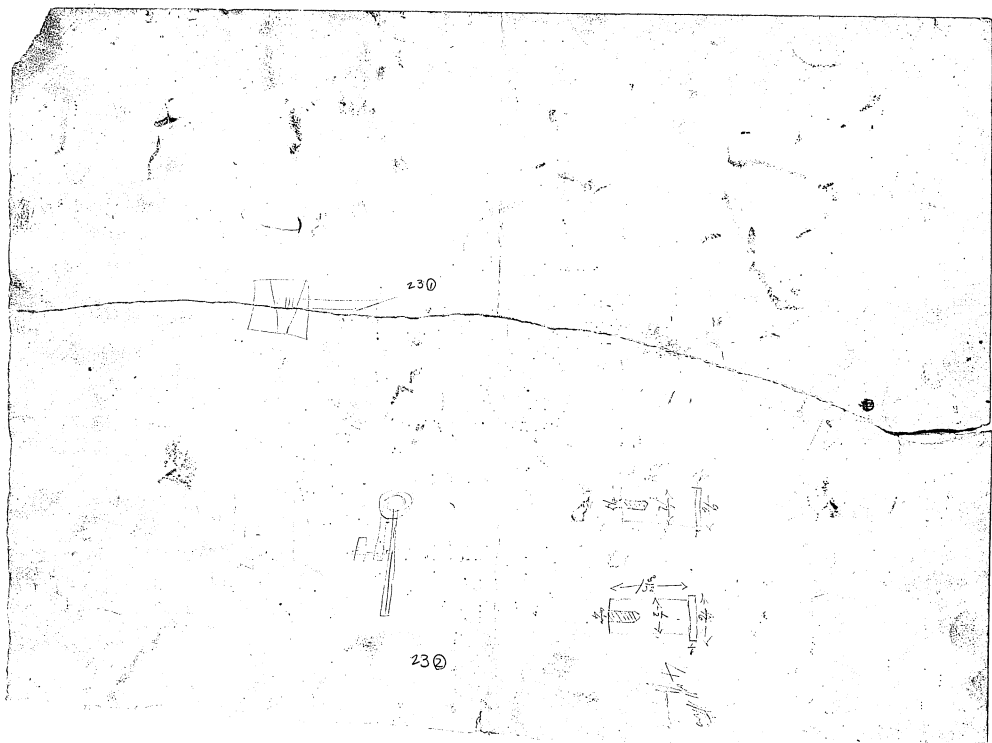
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Ink marker Run by air

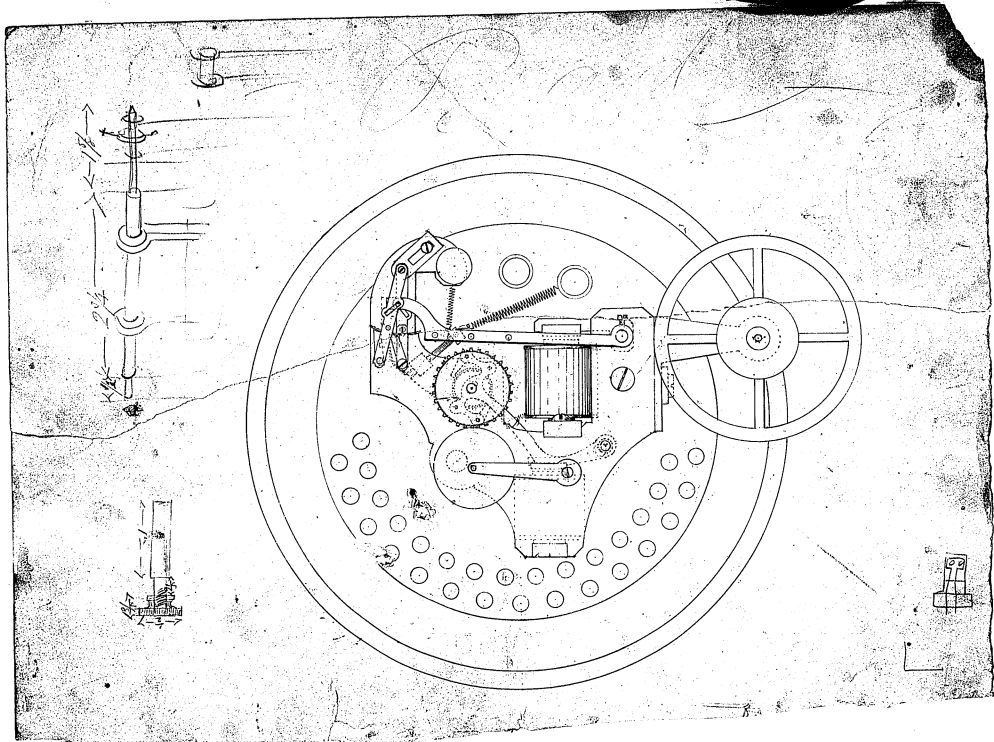


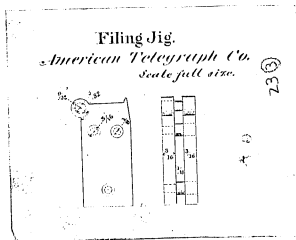
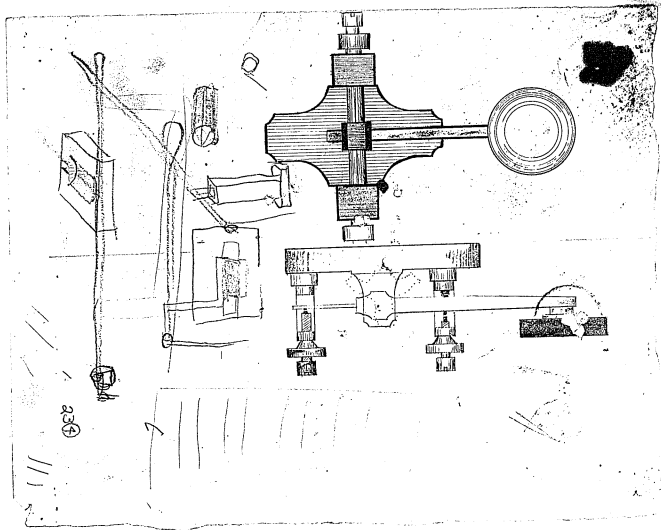


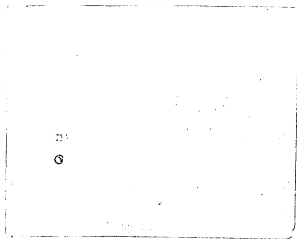
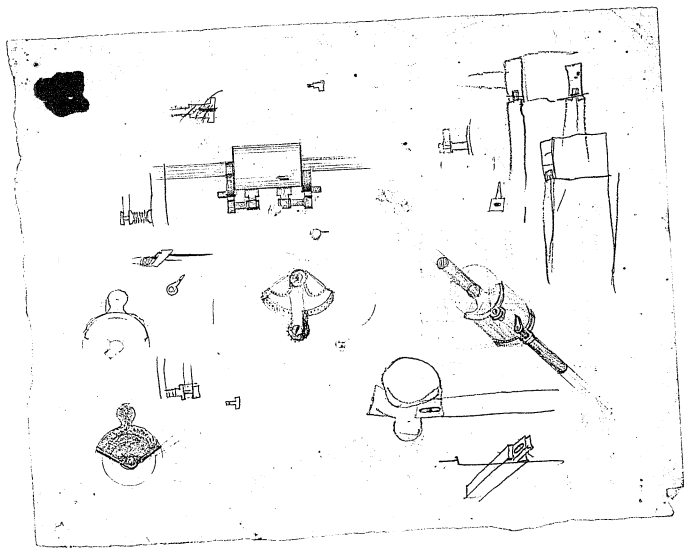




23





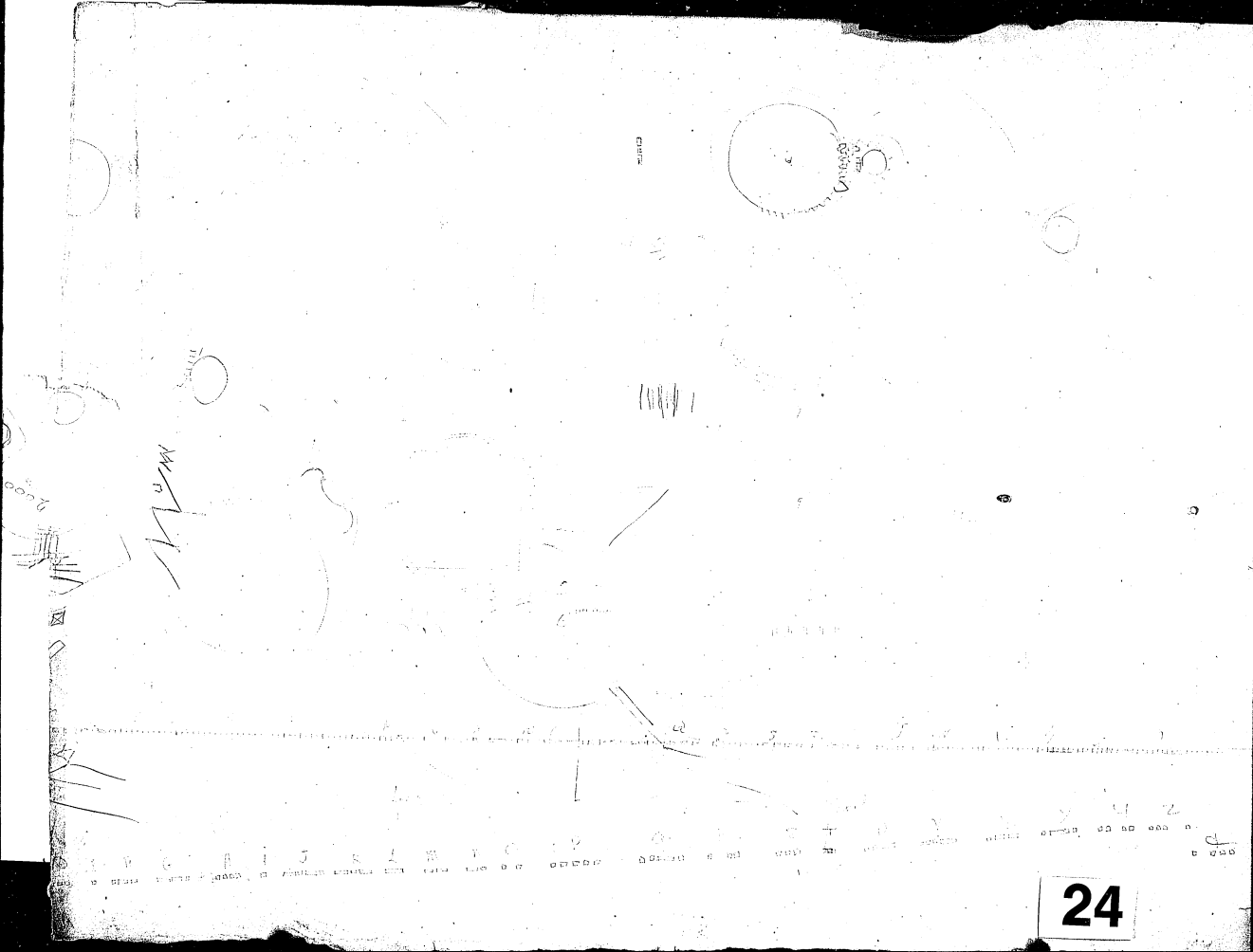


23



Technical drawing of a mechanical assembly, likely a pump or motor component. The drawing shows a central shaft with a large gear or flywheel on the left and a smaller component on the right. Various parts are labeled with letters and numbers, and dimensions are indicated. The drawing is a detailed line drawing with some shading to indicate depth.

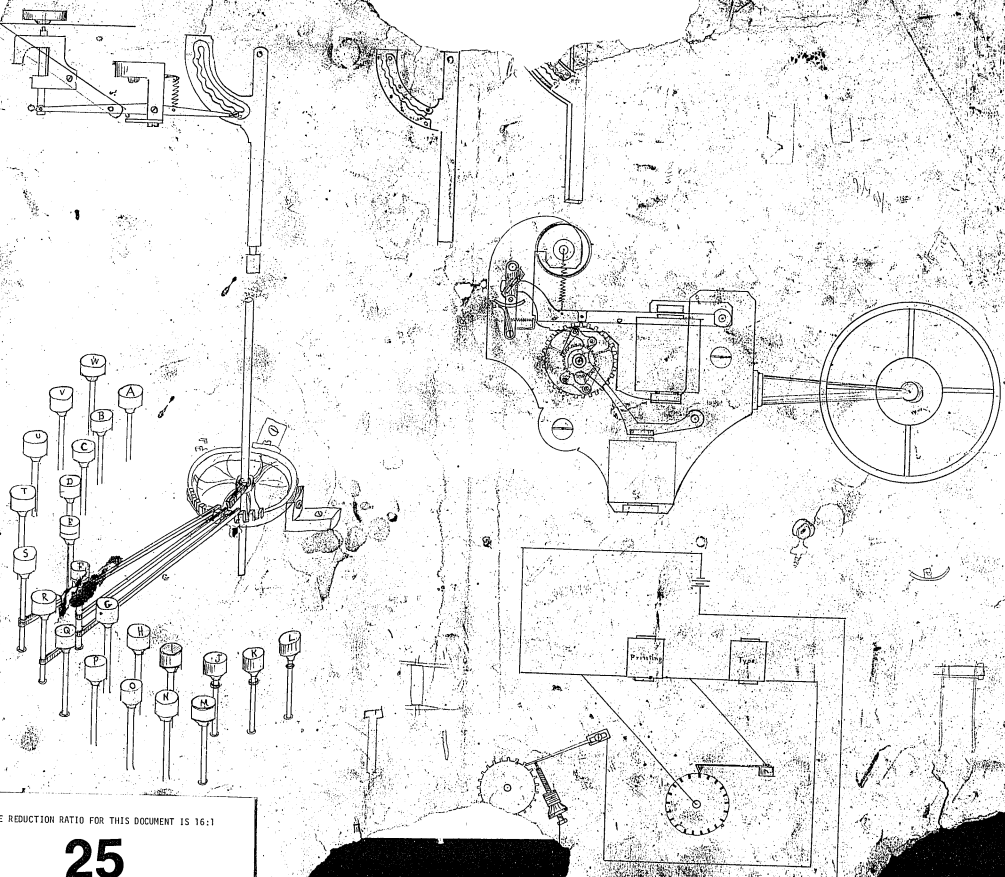
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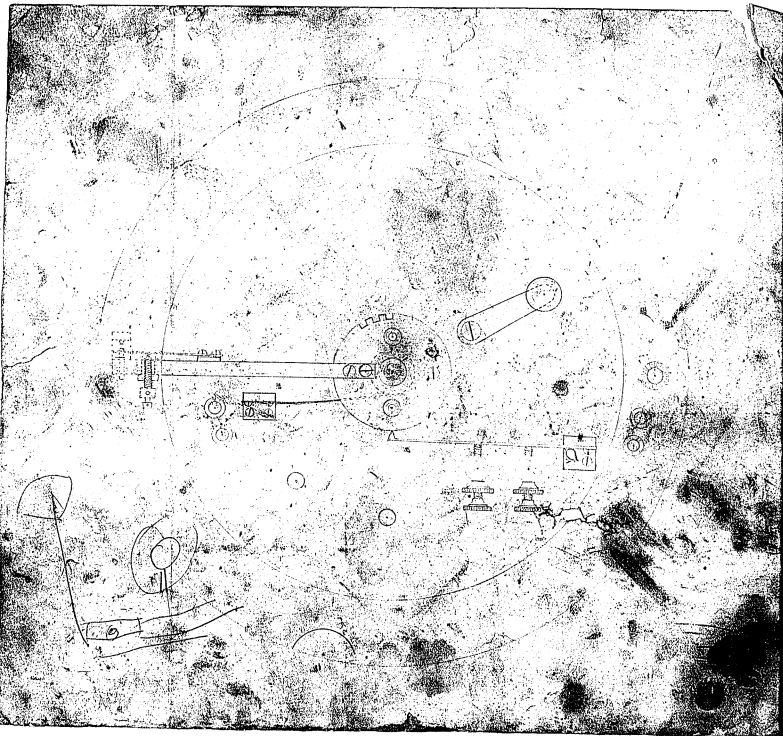




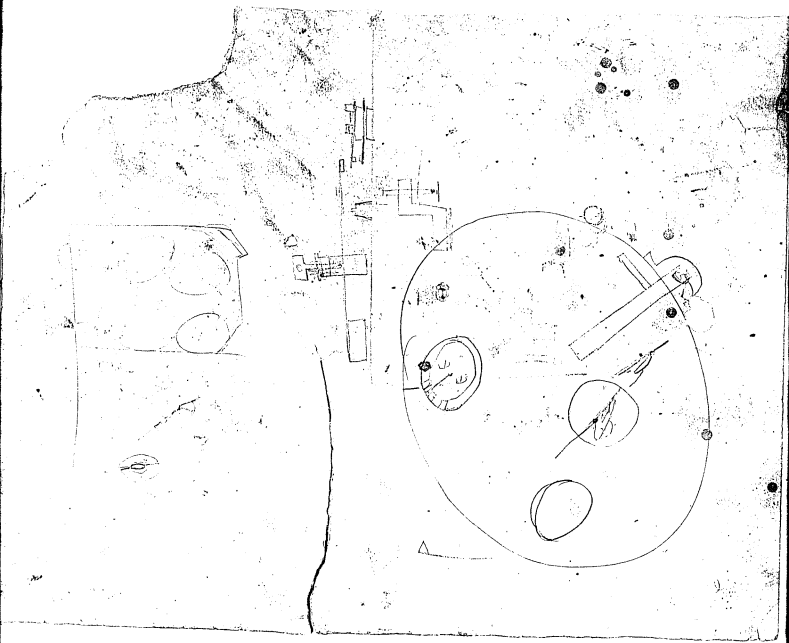
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25

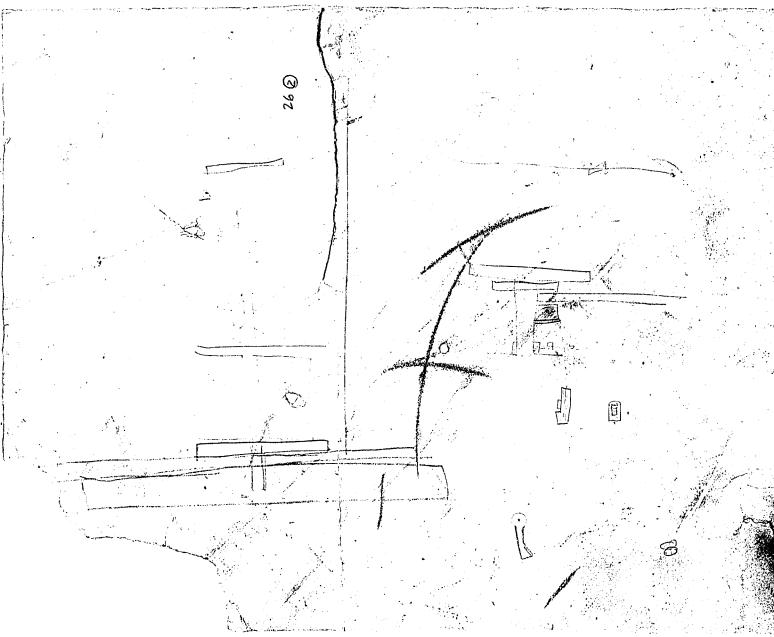




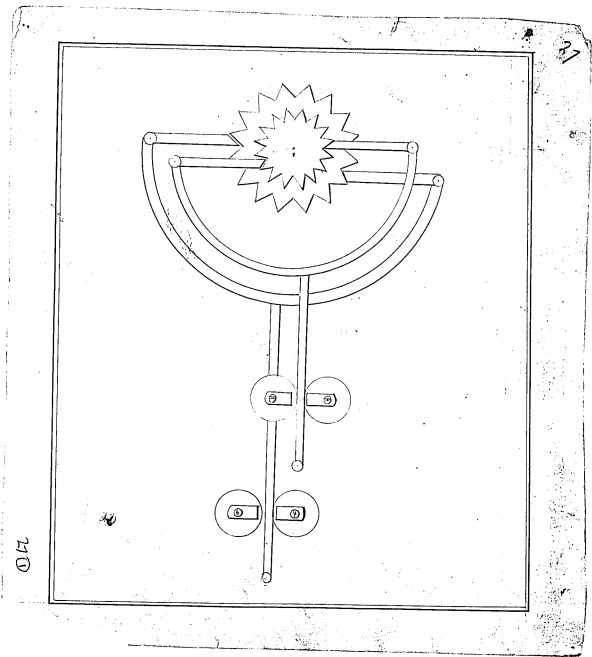
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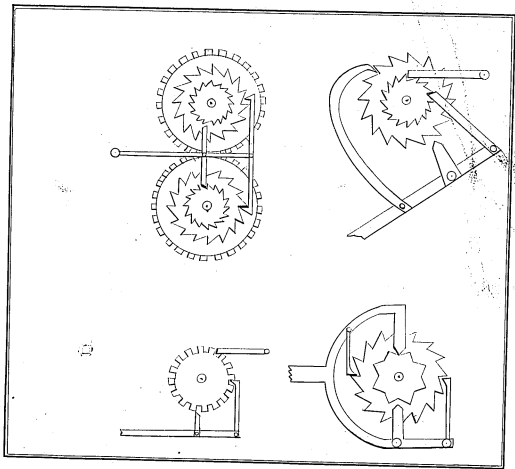
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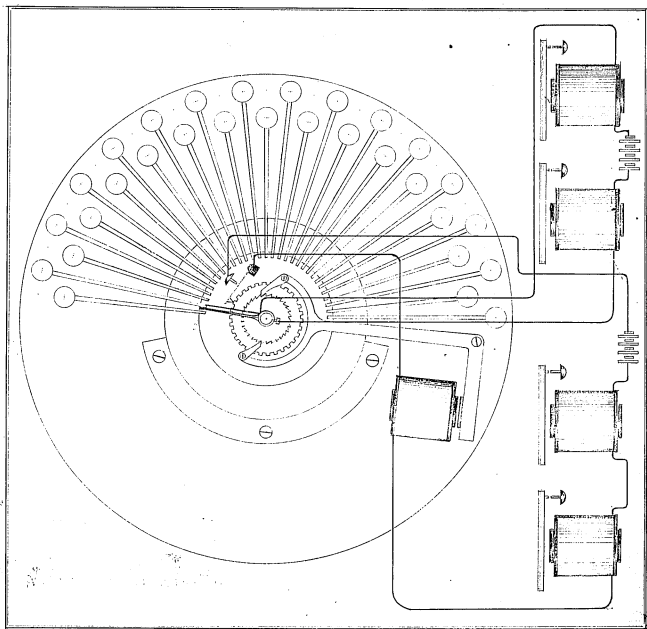


26 ②

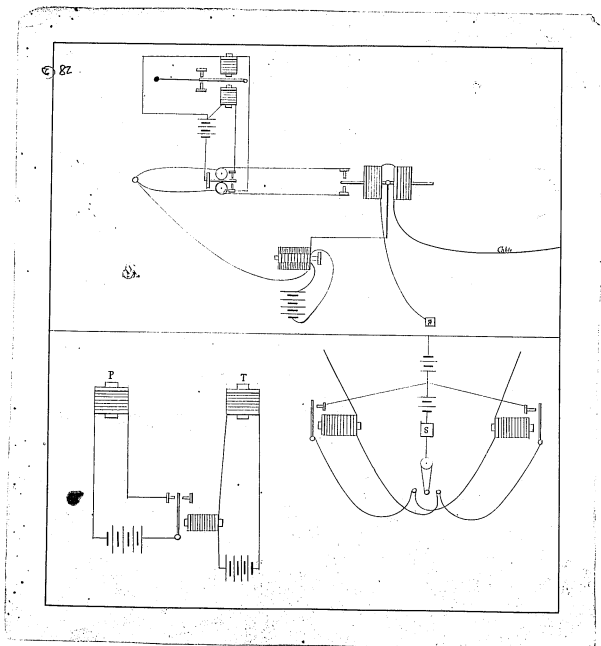


27



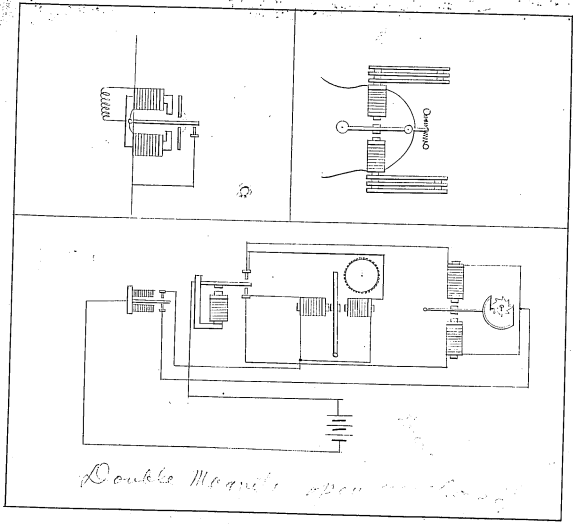


28

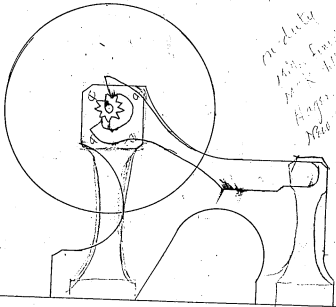
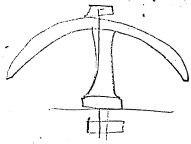




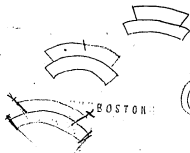
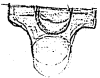
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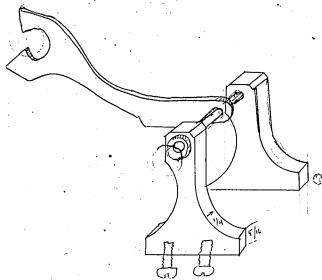


29 0

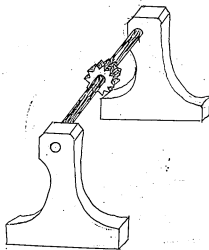


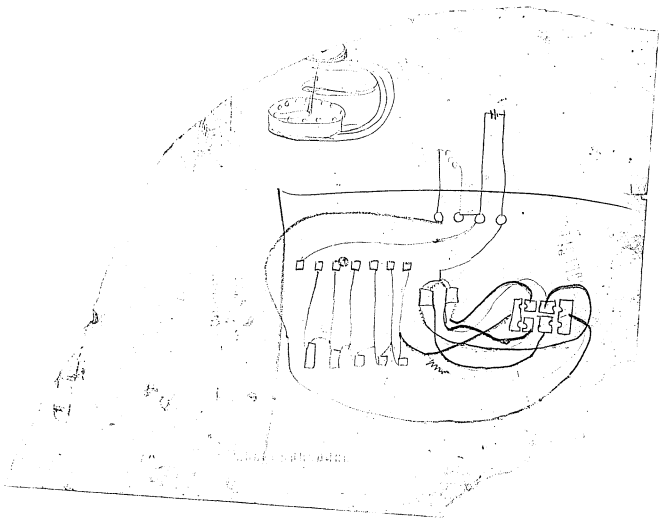
in ducty  
14th. Finished 9 pm  
Hager. 9 30  
Machina 10

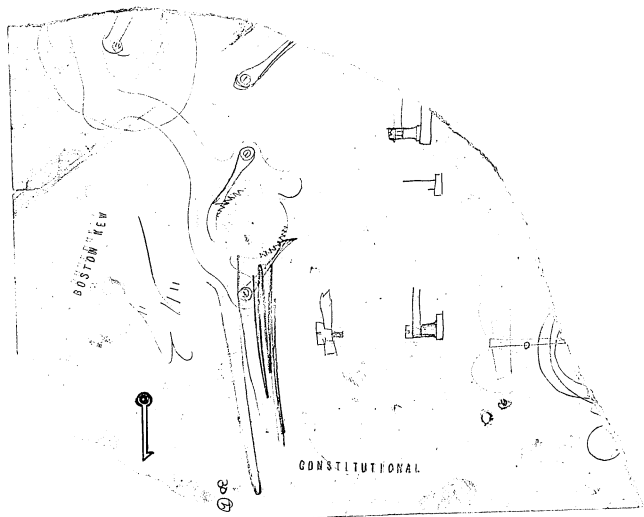


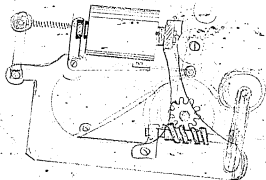
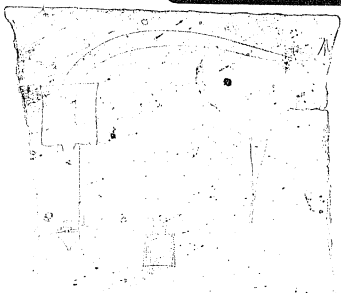


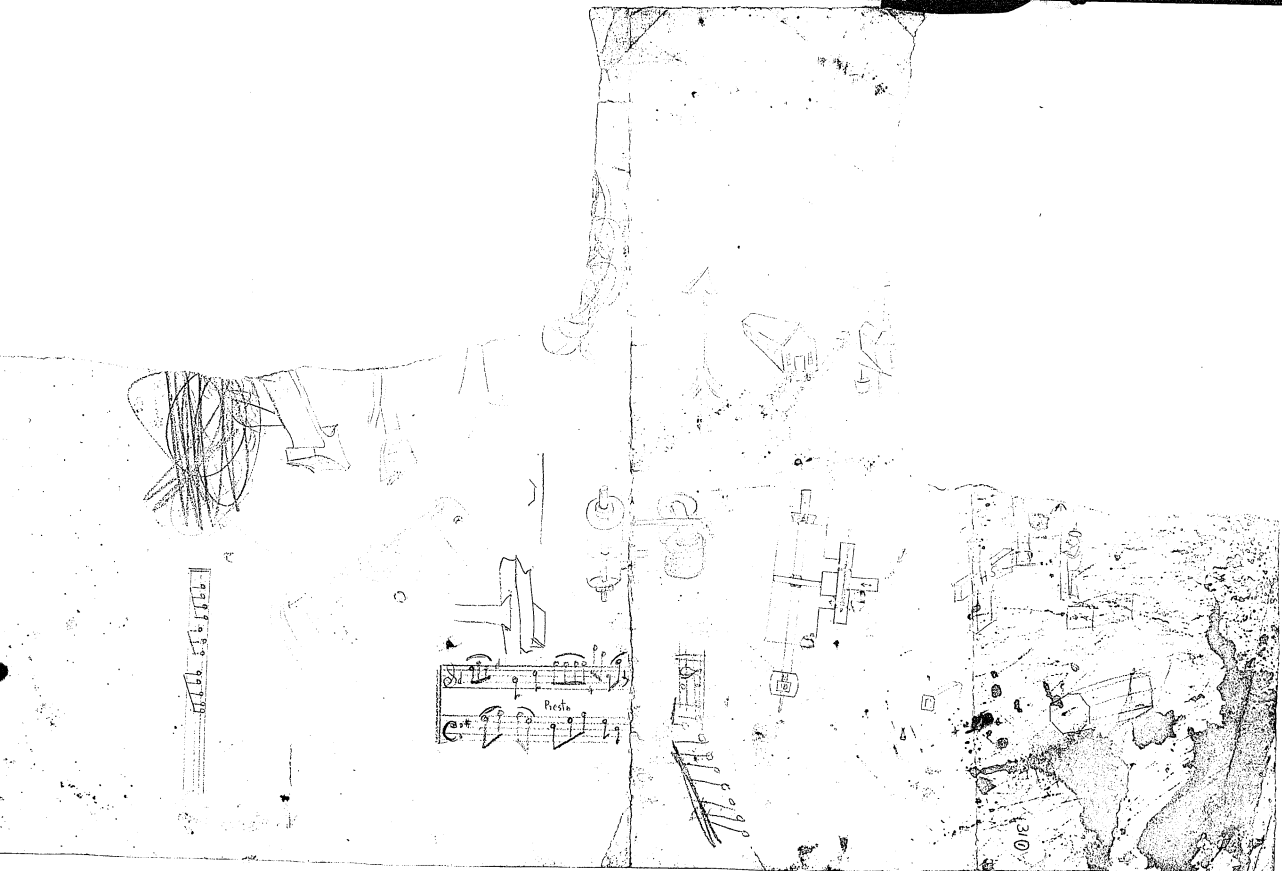
Step 2/16  
wheel this size  
1 1/32 diameter  
21



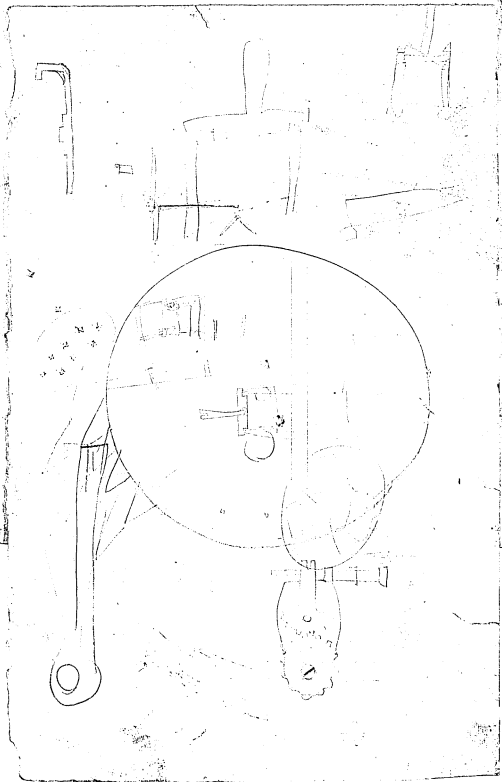




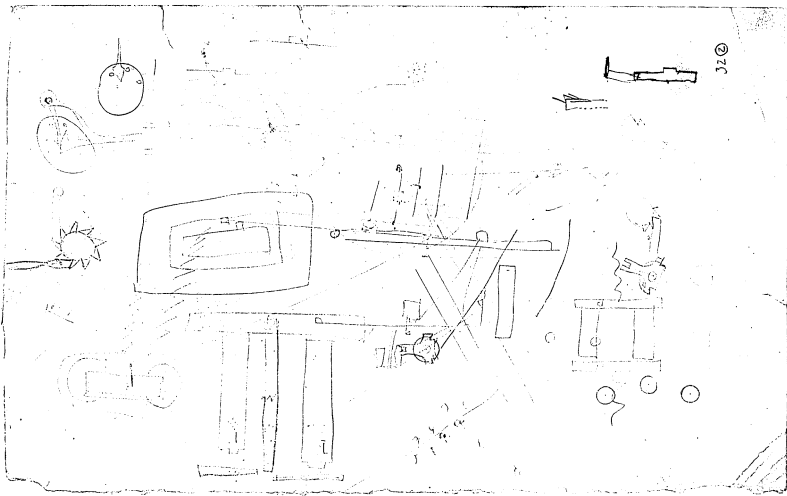




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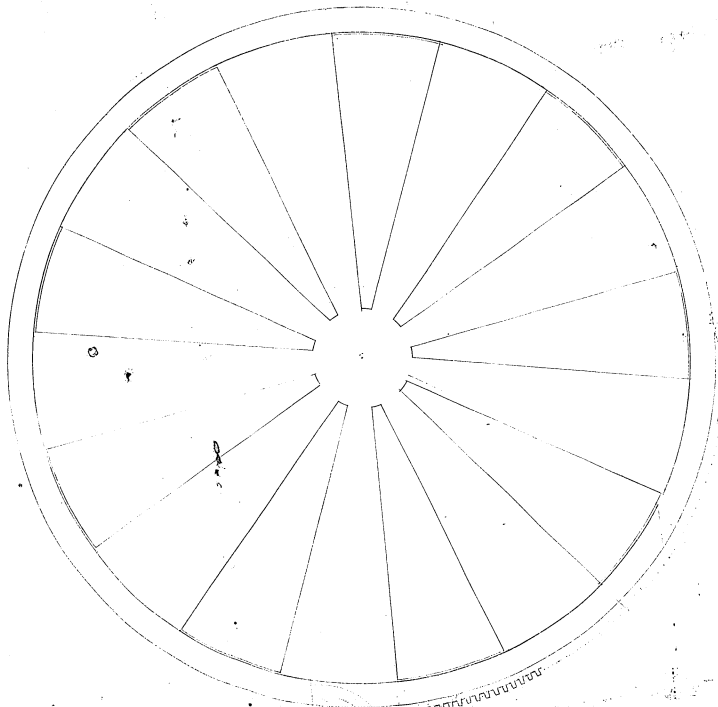


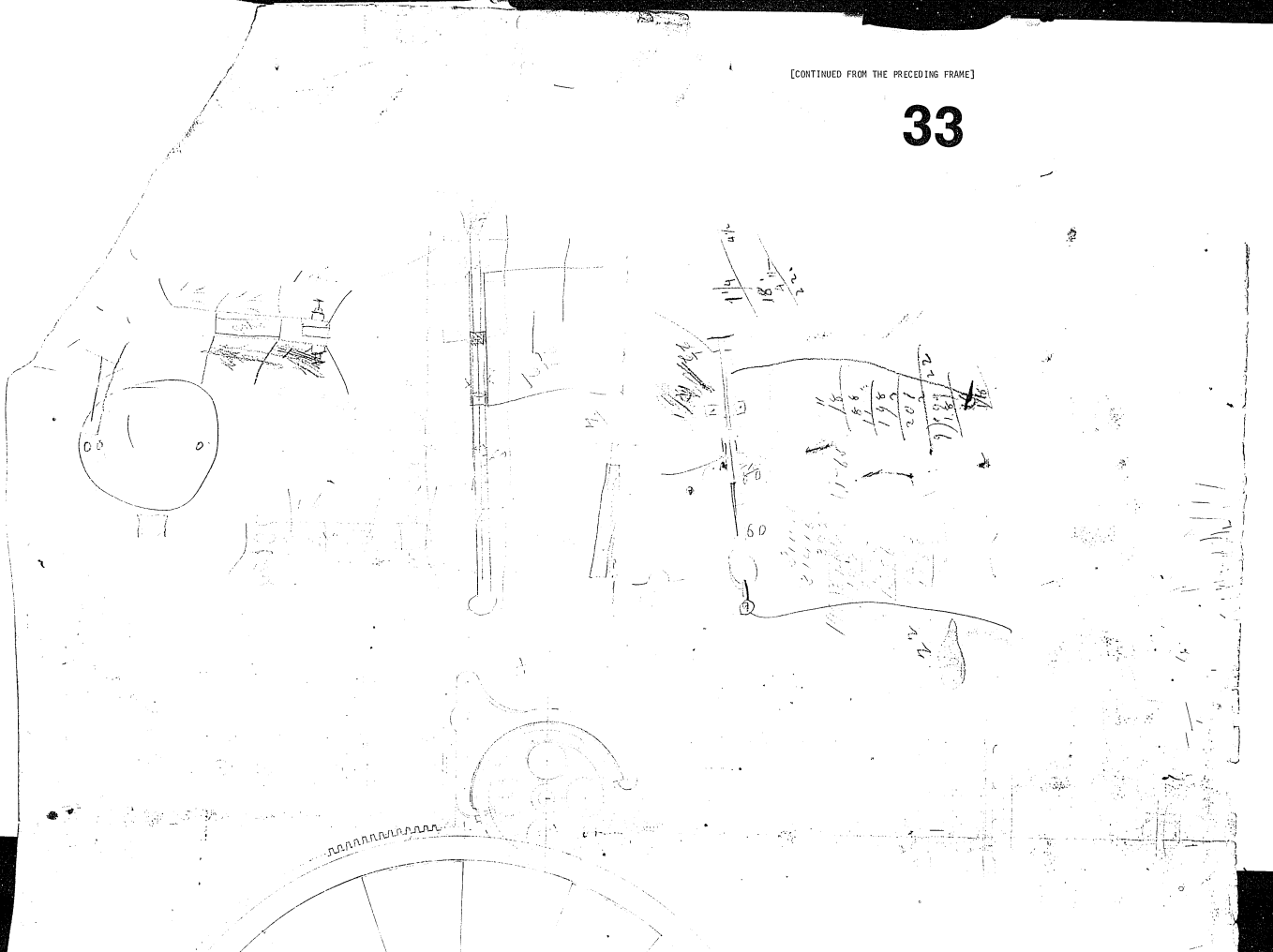


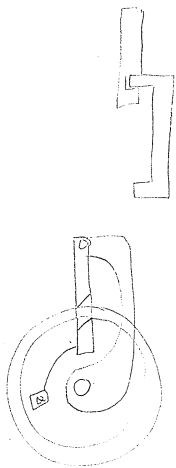


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33



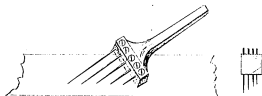




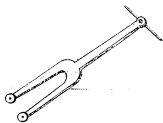
① 12



BOS



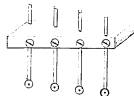
BOS



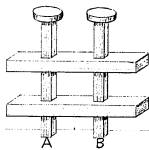
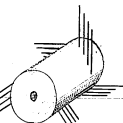
BOSTON

BOSTON

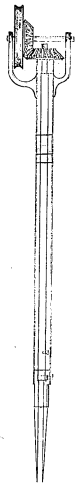
BOSTON



BOS

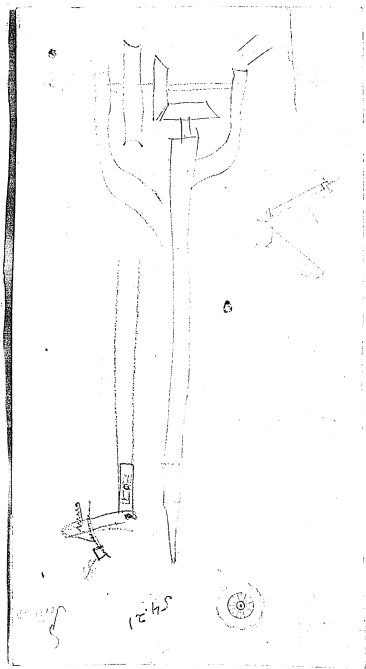


② 12



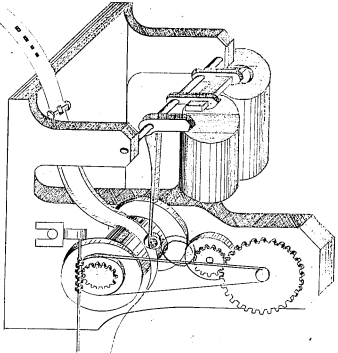
PATENT MILLING MACHINE FOR WASH-CRIMMERS.

34



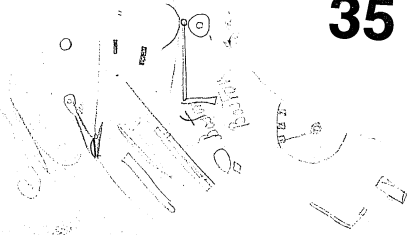
34

ARMATURE

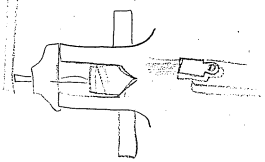
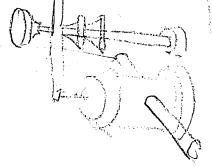
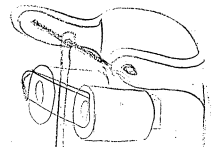
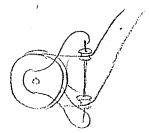
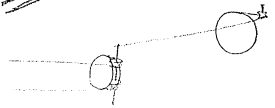


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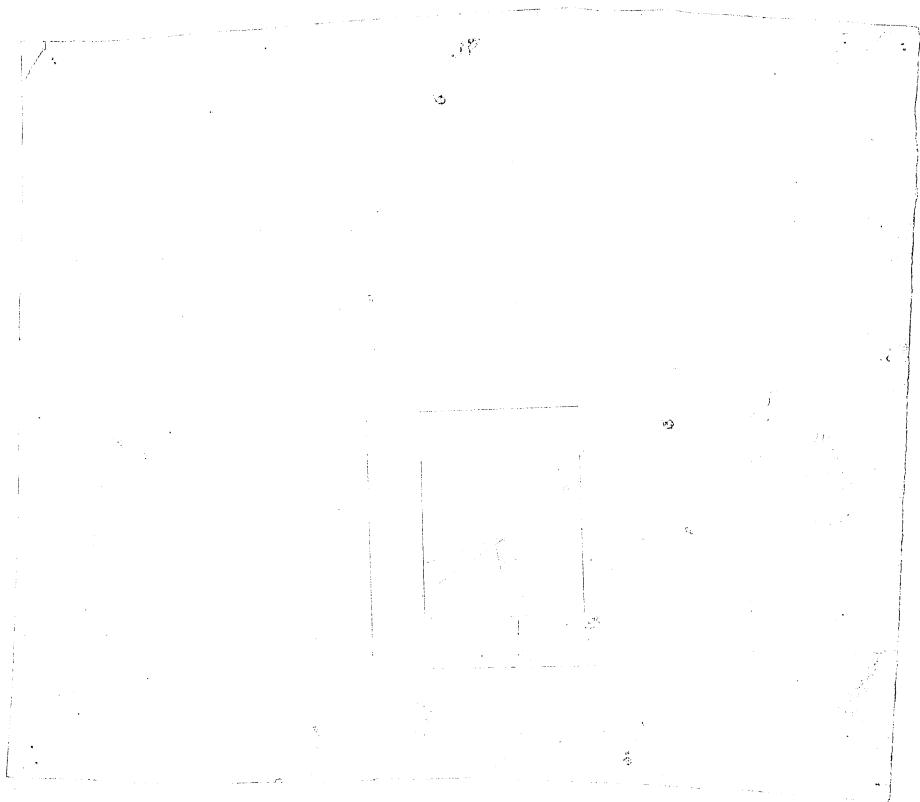
ARMATURE



35





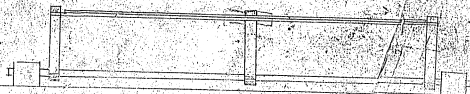
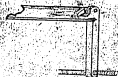
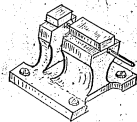
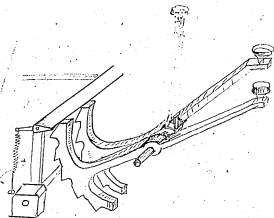
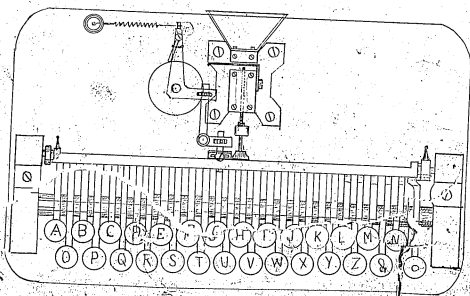


36

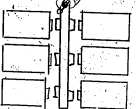
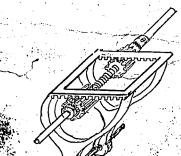
360

36

37



37



310

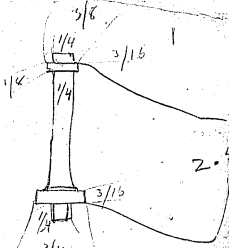


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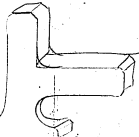
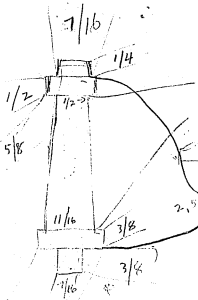
11/16

(10-10)

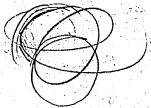
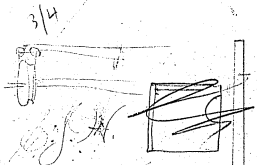
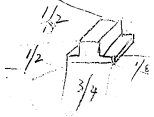
diam 1.5/16 cast iron



2.5/8

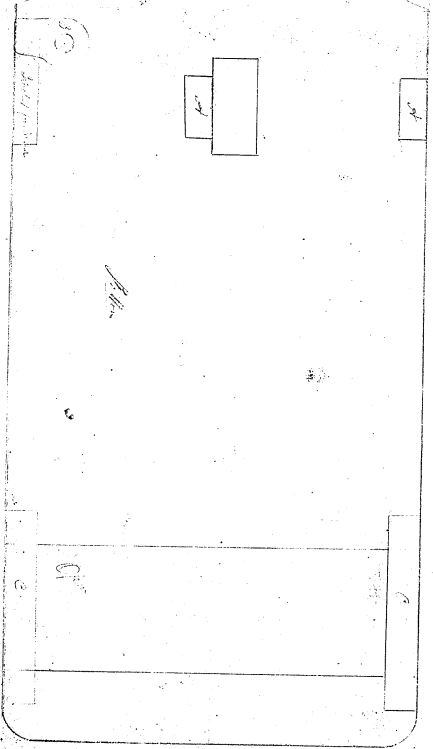
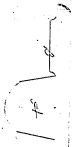


7/16 5

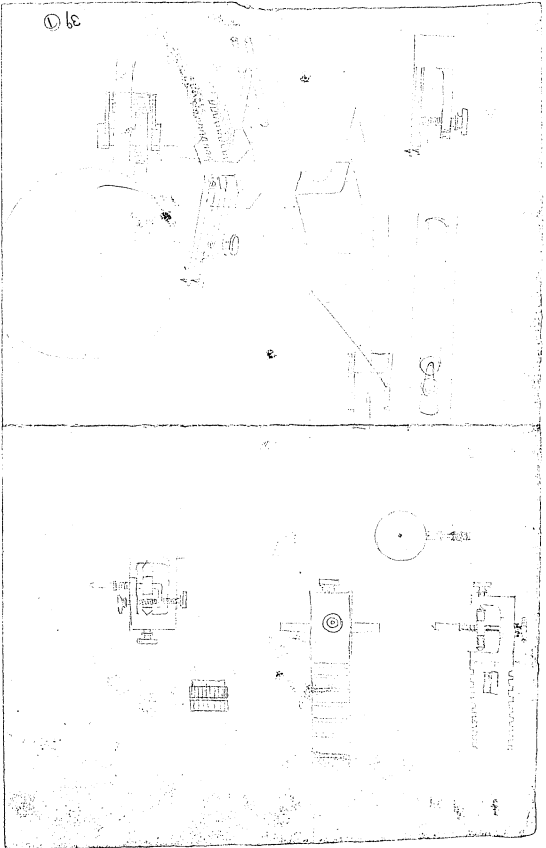


380

38



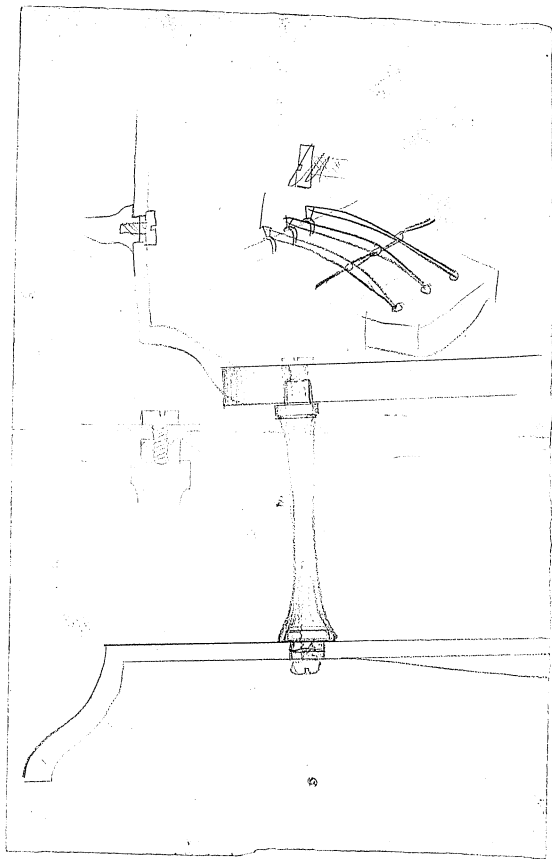
*Handwritten signature or initials*



39

39

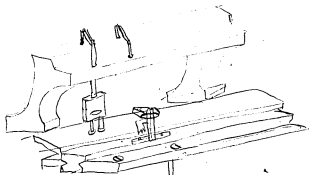
39





OFFICE OF THE  
AMERICAN TELEGRAPH WORKS  
No. 103 NEW JERSEY RAILROAD AVE.  
NEWARK, N. J.

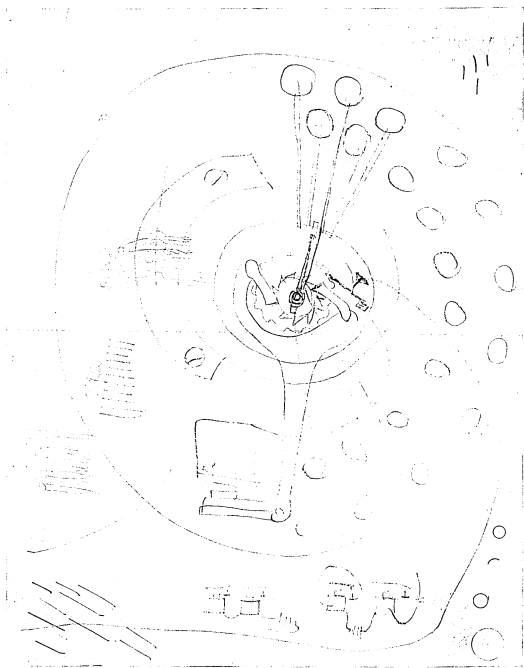
Howell, N. J. 187



Cenaphobean!

Cempolitaneum  
Adonis Voluptuous Case!  
Cupidium Cereum Veluminus  
Chase armorous angels  
With thy ponderous  
progenitive Apparatus

39 (2)

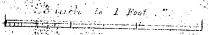
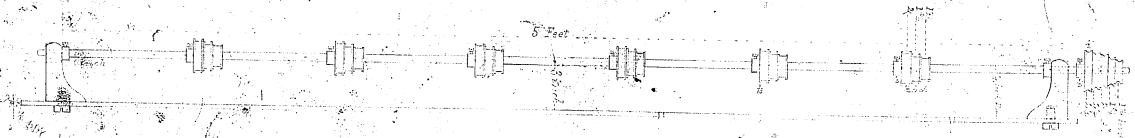


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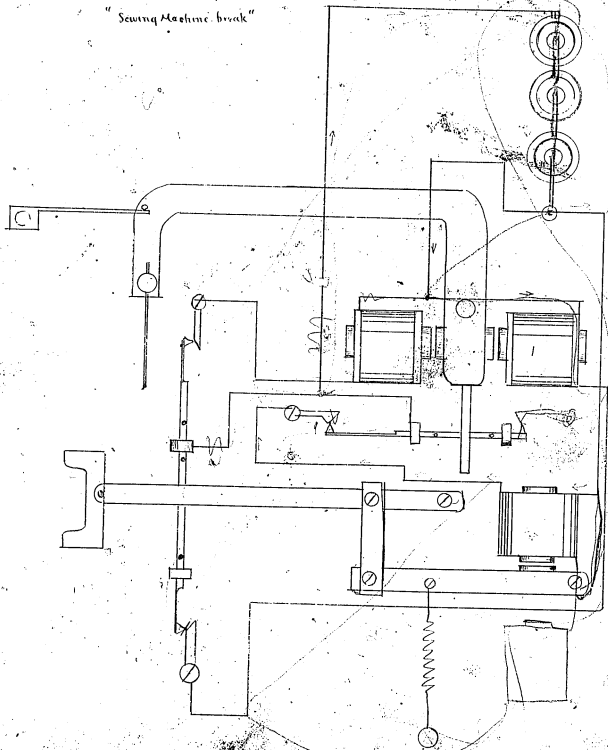
— Ad. Alta Grav. —

Coll.

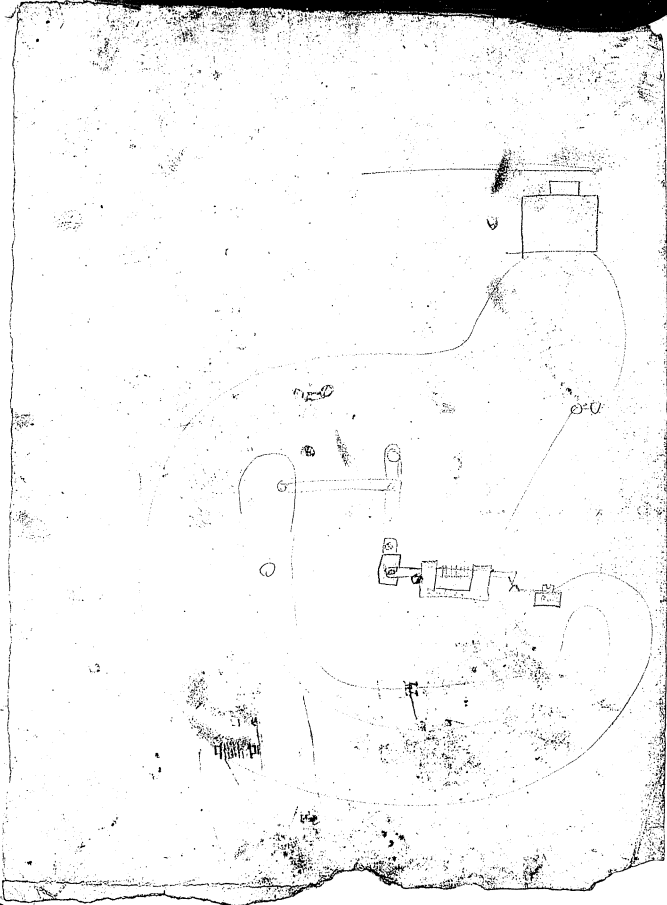
Coll.



"Sewing Machine break"



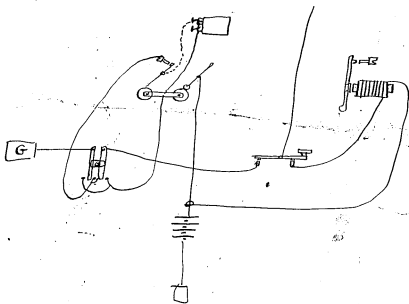
430



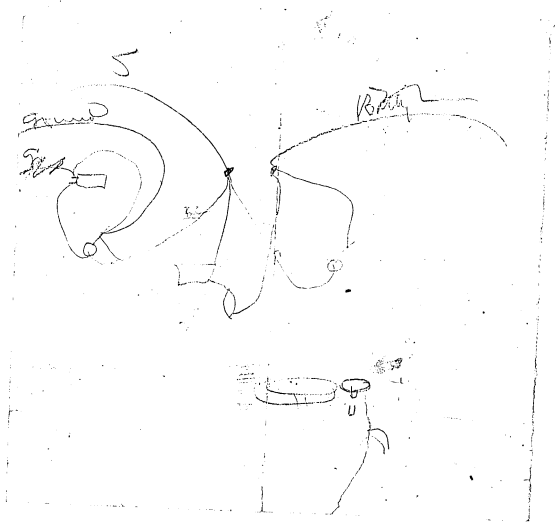
Automatic Telegraph Company,

80 BROADWAY, ROOM 30.

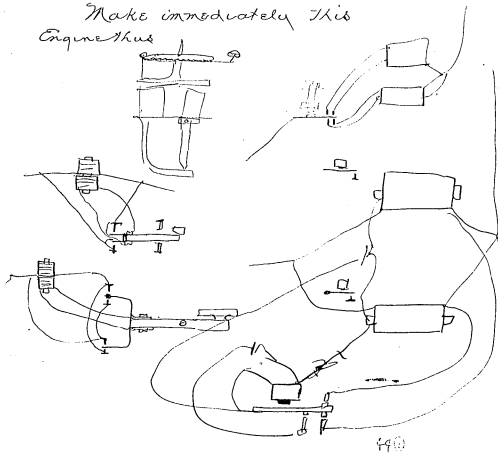
New York, 187



43 ①



Scan  
Make immediately this  
Engine thus

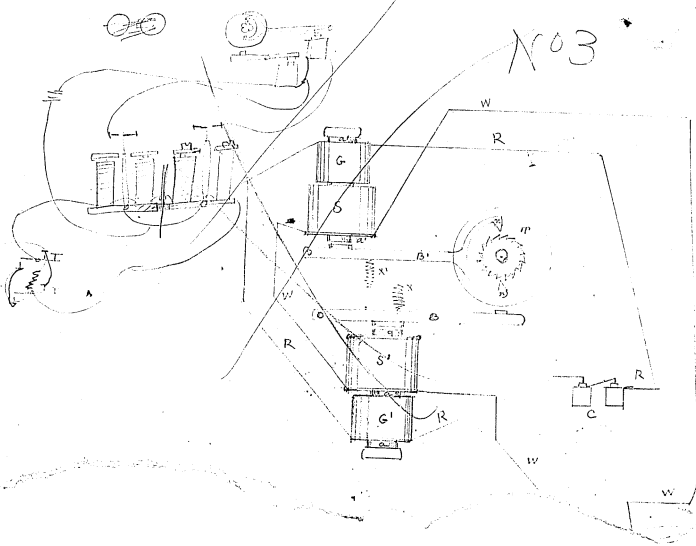


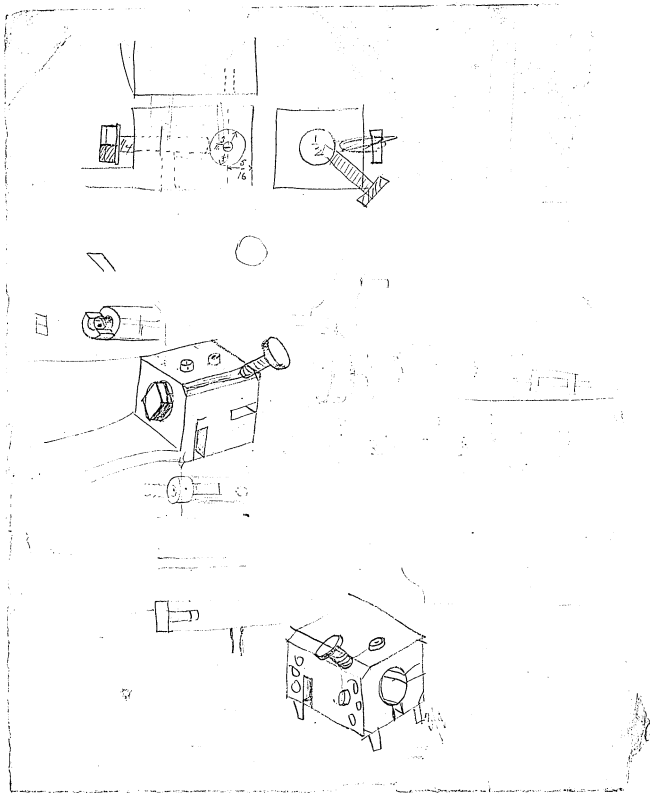


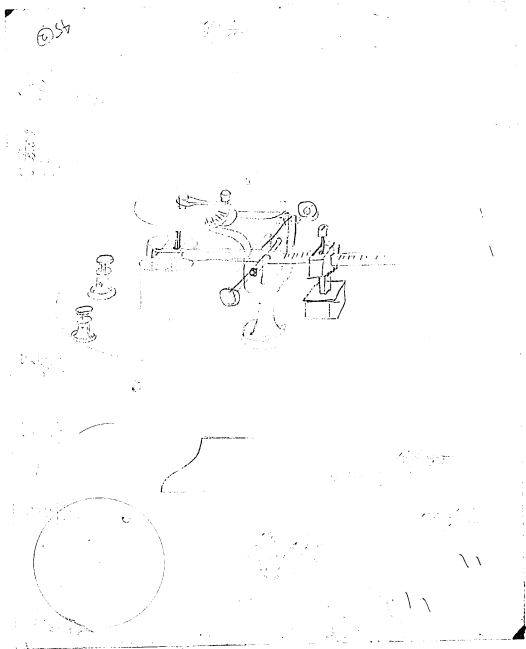
No 2

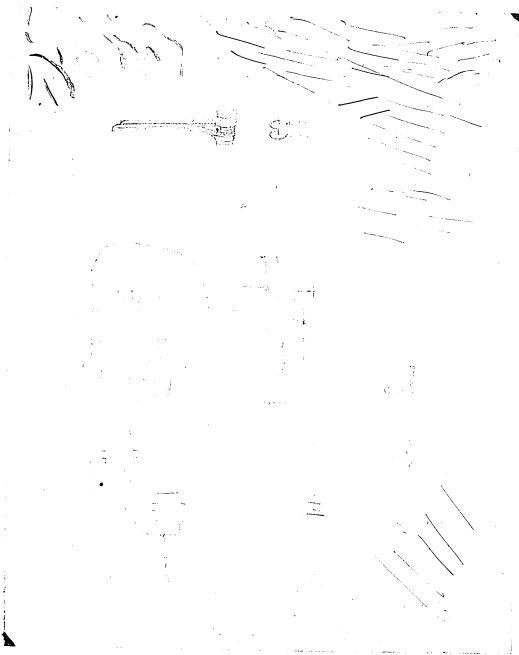
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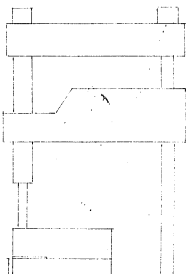
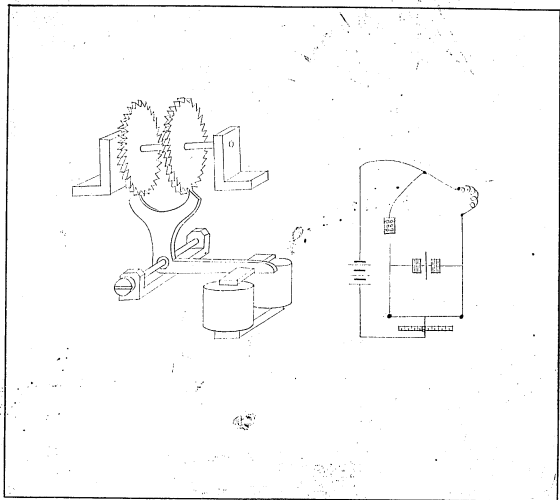
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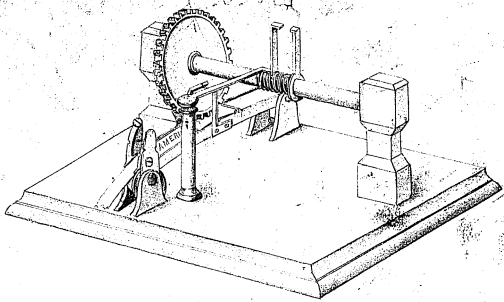






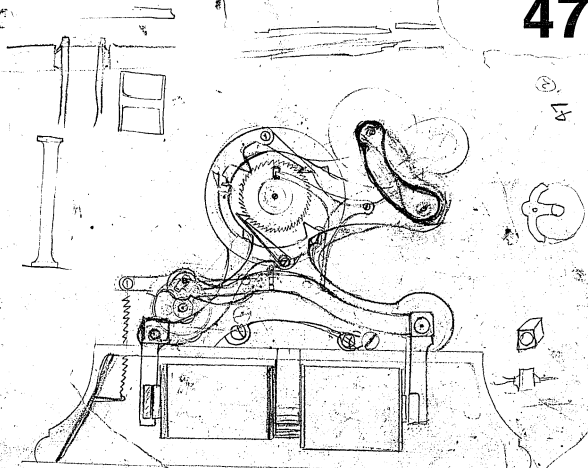
46

47

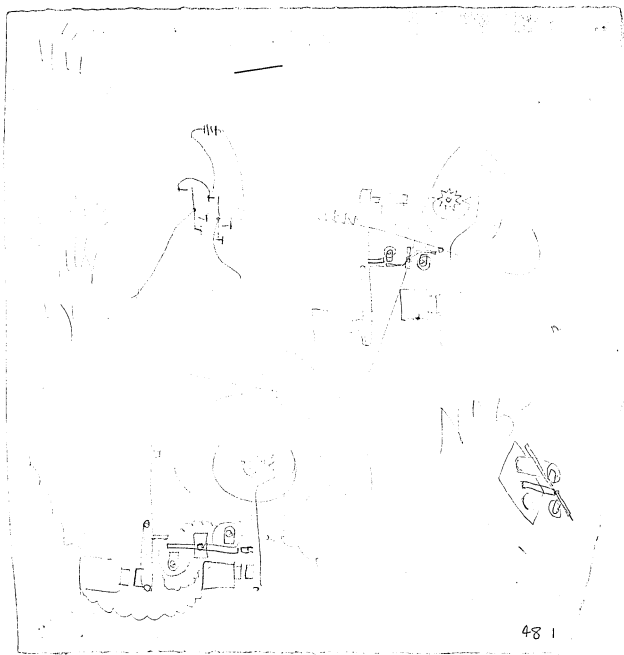


47 ①

47



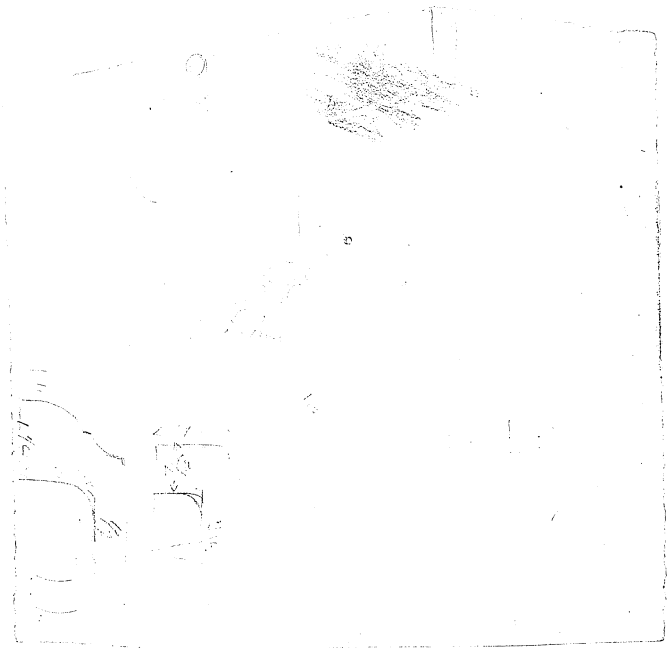




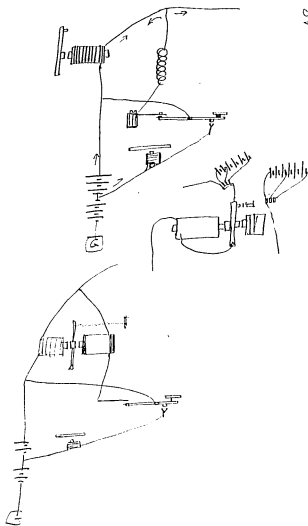
48 |

48



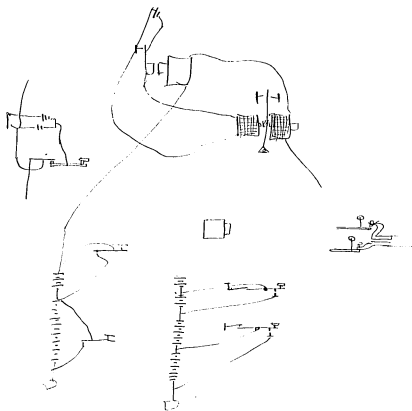


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48 2

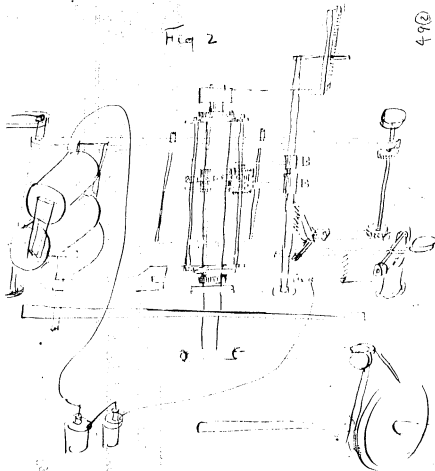
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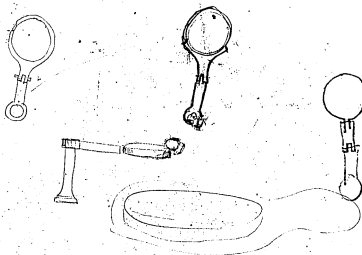
48

Fig 2

492

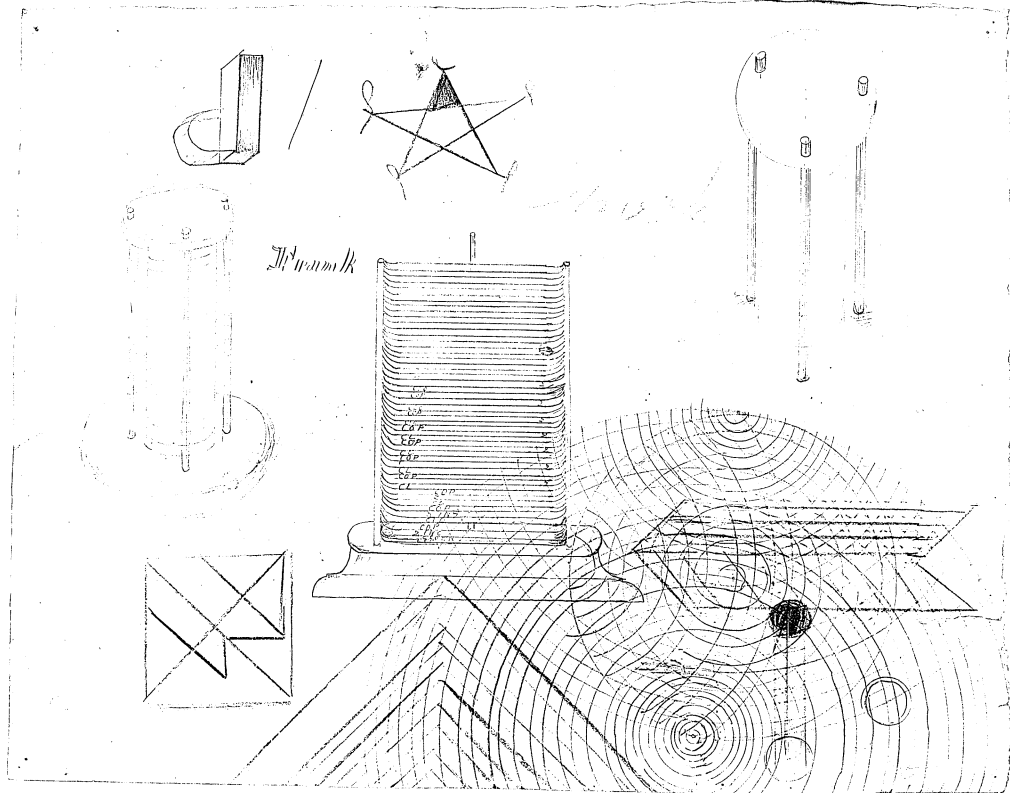


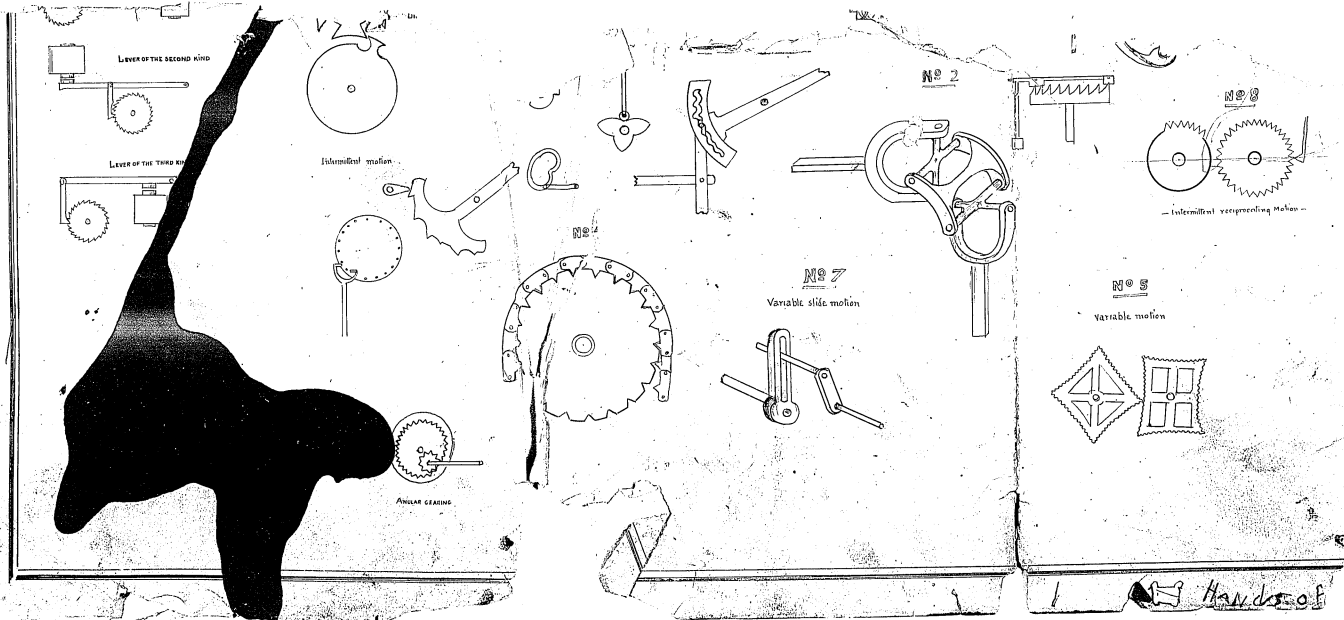
066



49



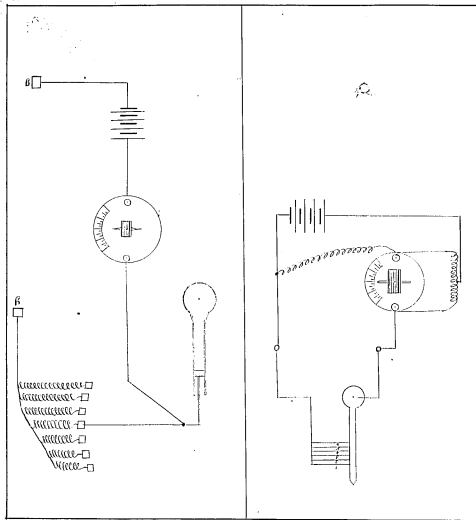




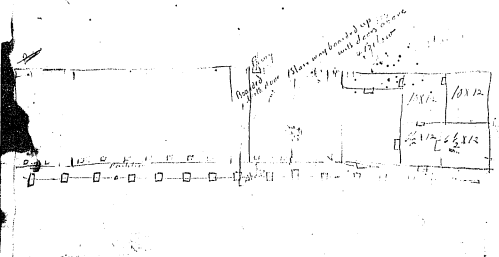


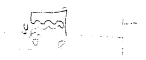
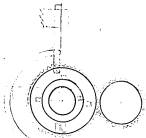
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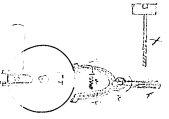
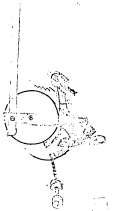
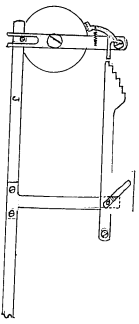


52 ①





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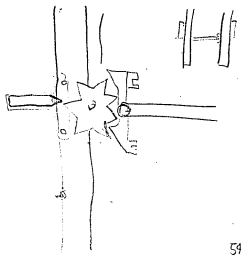


53

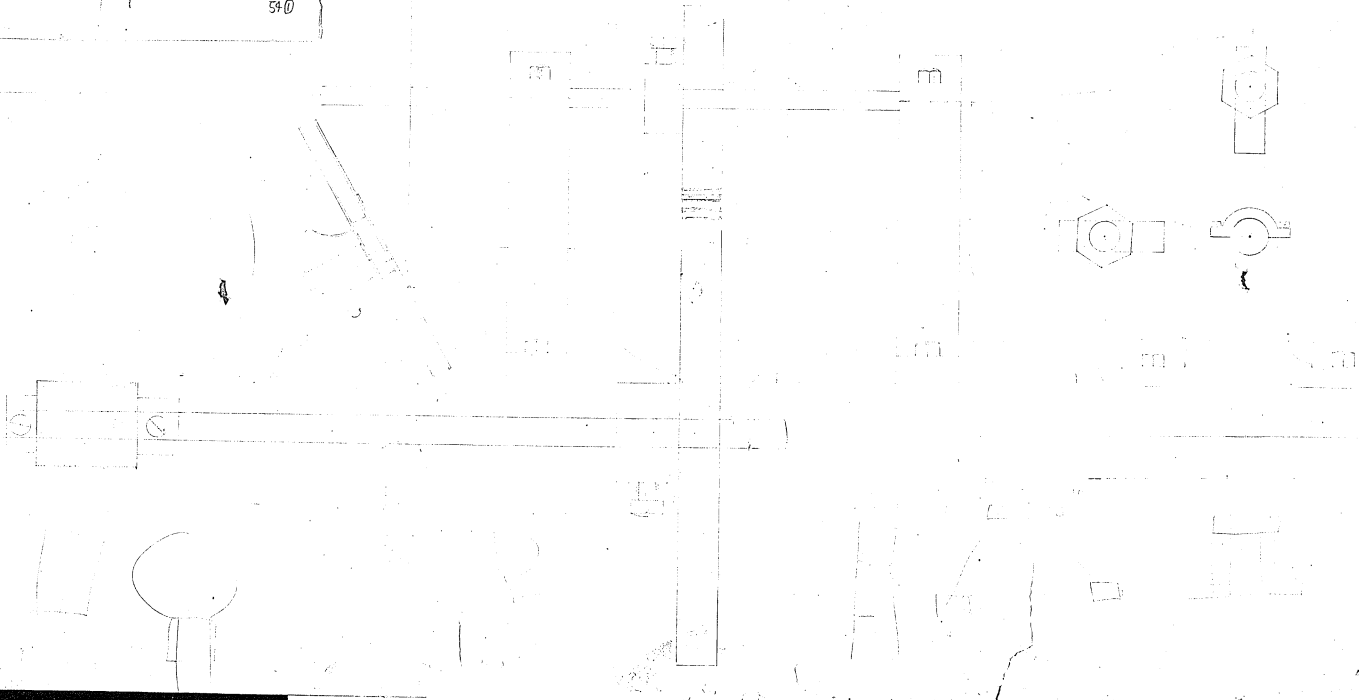
Thermometer Attachments  
FOR  
*Stenborg's Hydrotas*

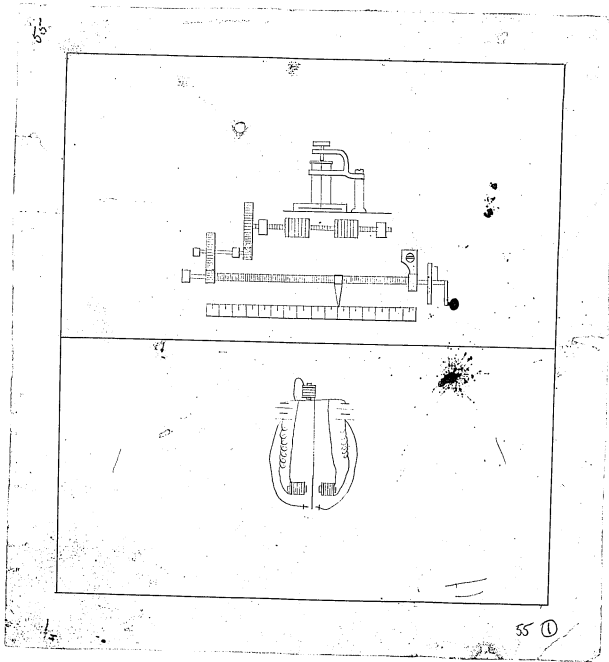
53

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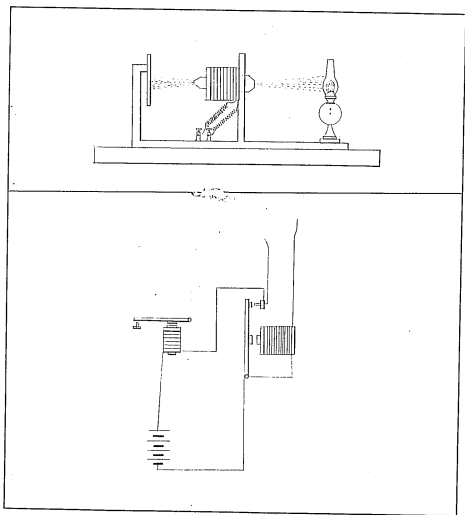


540





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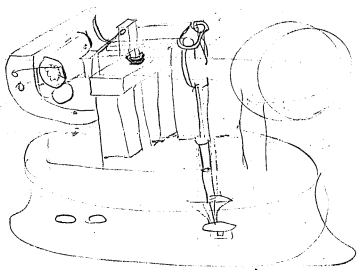
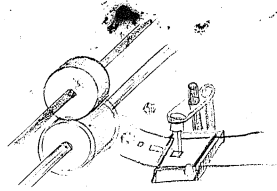


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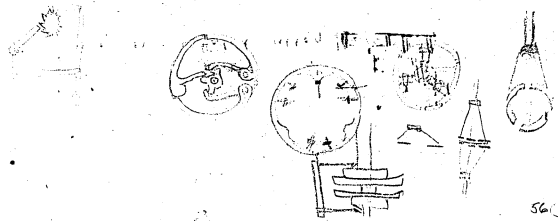
95

① 95  
 27 8  
 55 5  
 110 11  
 8 81 10  
 4 40 8  
 9%



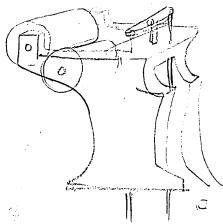
27 8  
 55 5  
 110 10  
 8 81 8

56



56 (2)

56



ES<sup>r</sup>

ED 1834.

NATHAN LANE,

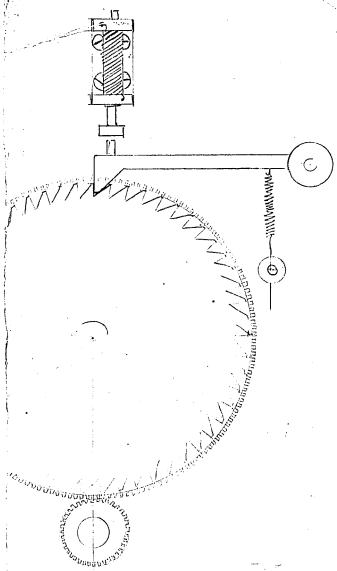
Beaver Street, New York,

STATIONER, AND Printer, Lithographer, and Blank Book Manufacturer. .

A full assortment of Foreign & Domestic Stationery constantly on hand.

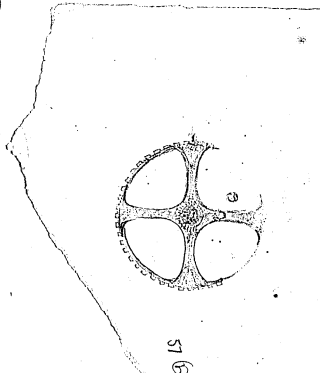
No Blank Books are made in the United States or Europe, superior in Quality, Style and Finish to those manufactured by me.

56



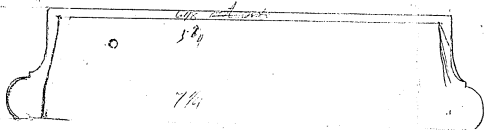
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57

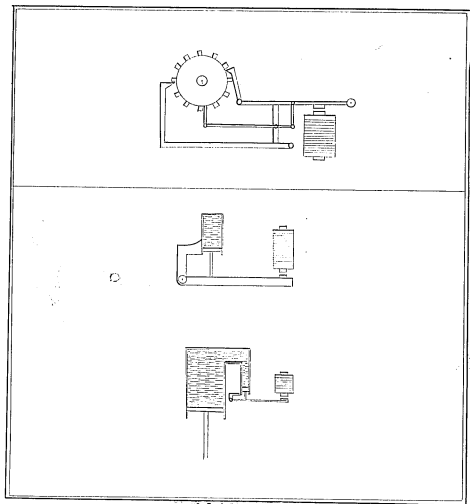




7/14

57 ①

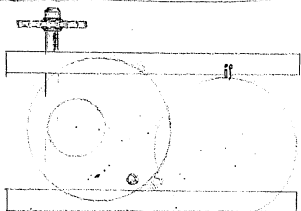
57



0 85

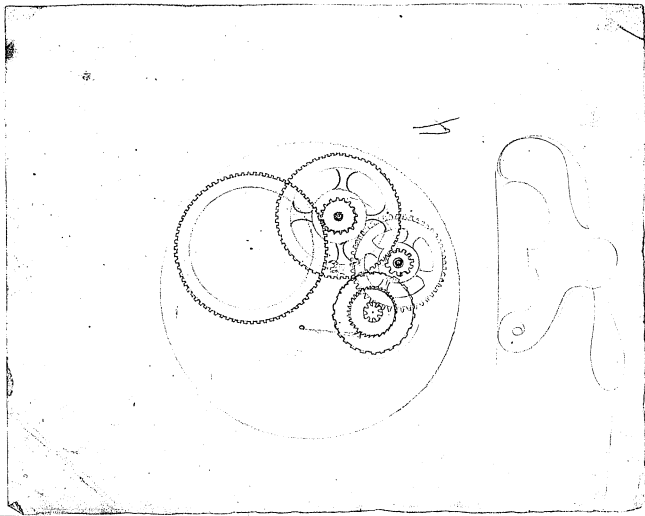
84

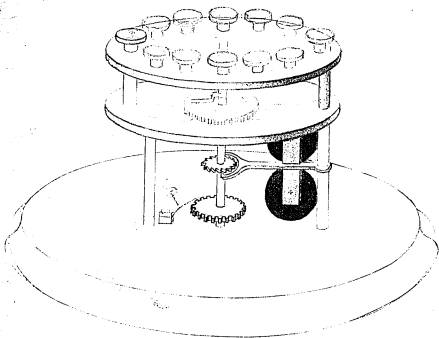
58



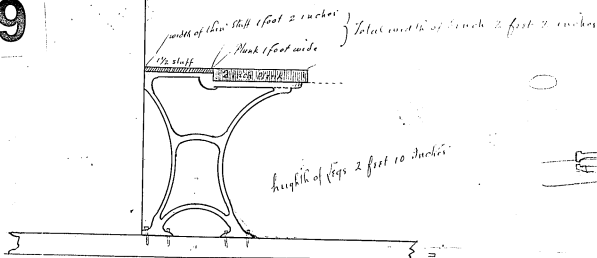
158 ②

58





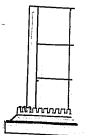
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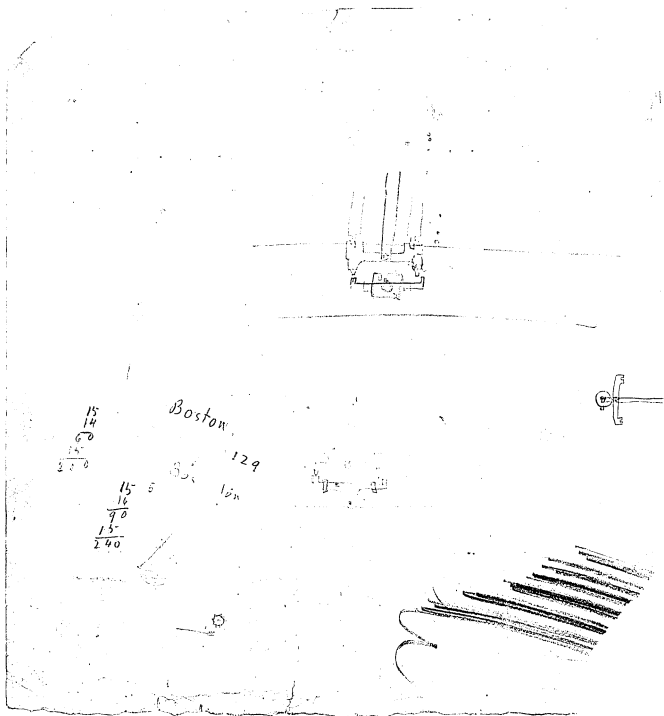


Wright will furnish Legs from this design  
at  $4\frac{1}{2}$  per pound



one foot Ten inches high





Boston

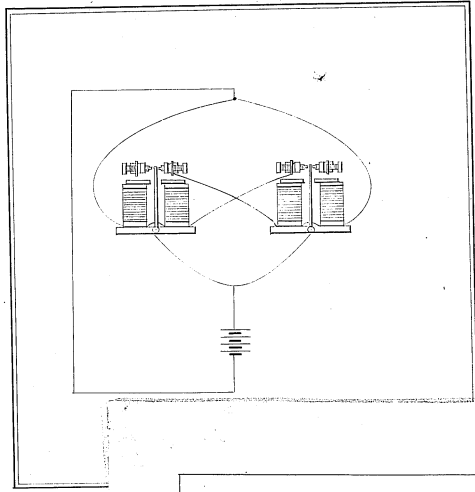
129

100

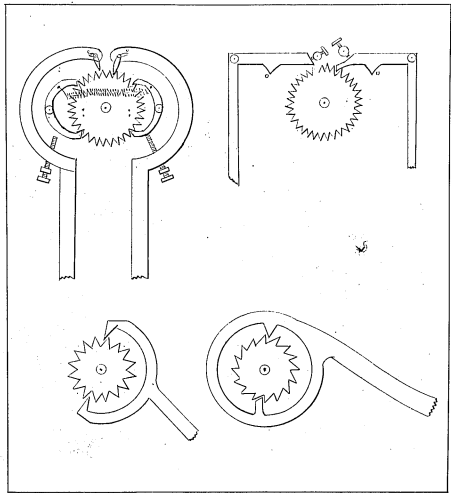
$$\begin{array}{r} 15 \\ 14 \\ \hline 60 \\ 15 \\ \hline 220 \end{array}$$

$$\begin{array}{r} 15 \\ 16 \\ \hline 90 \\ 15 \\ \hline 240 \end{array}$$

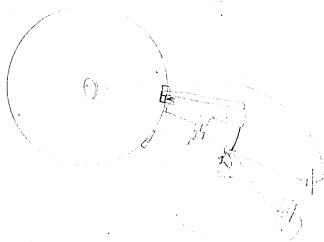
59



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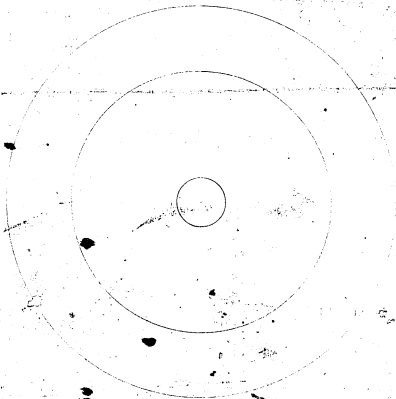


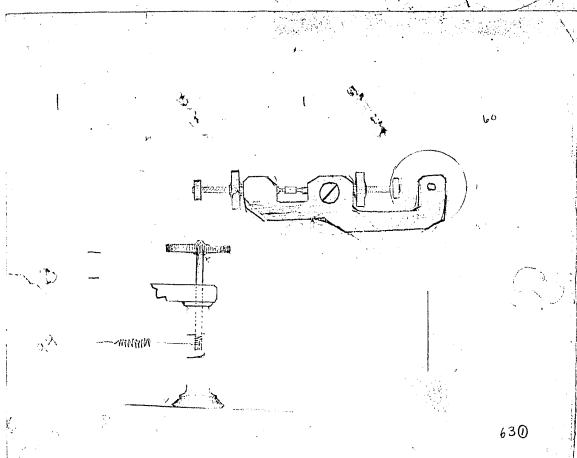
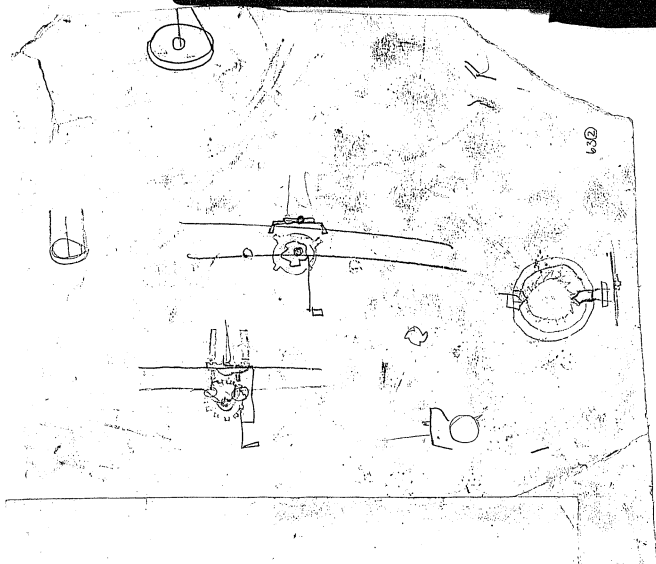
*Fly Wheel*

*American Telegraph Works.*

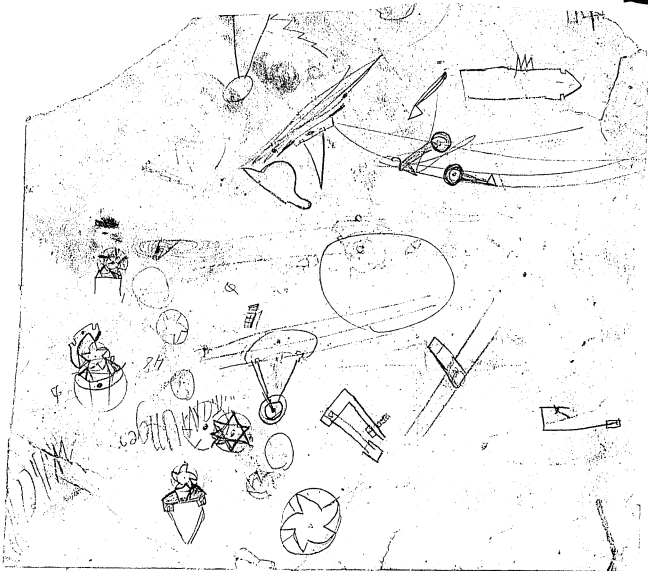
*Newark N.J.*

*Dec 2, 70.*

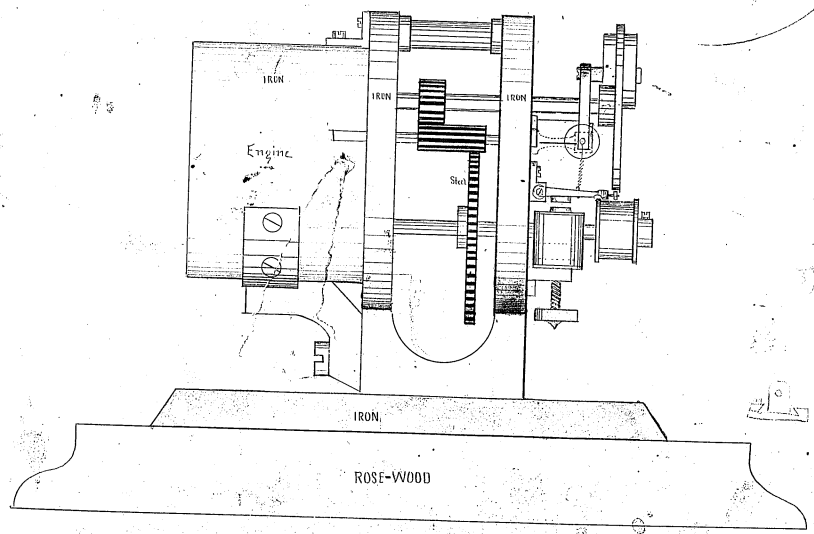


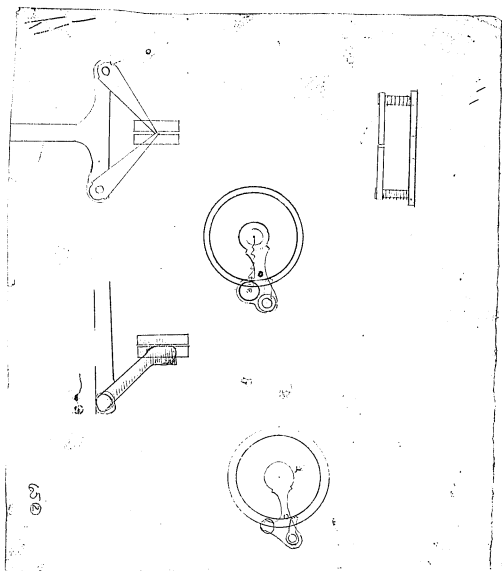


63

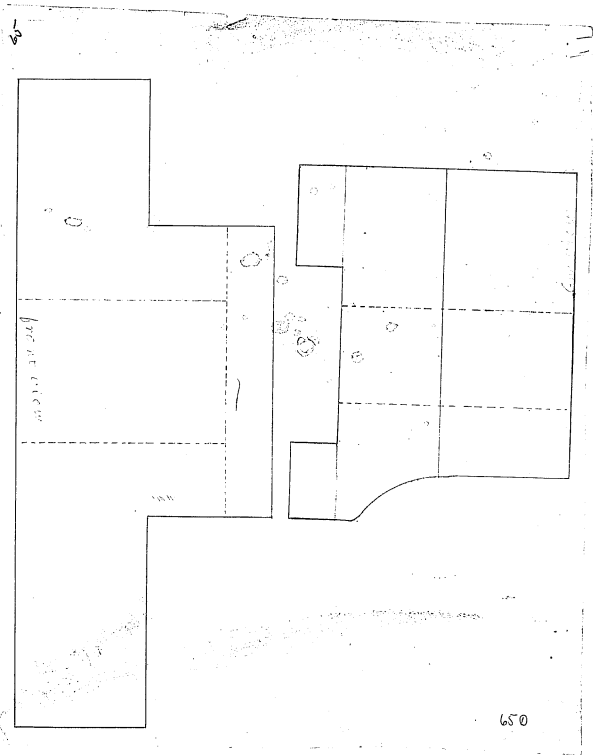


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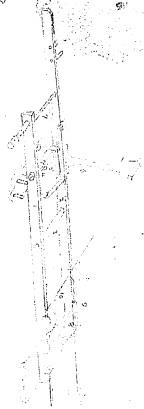
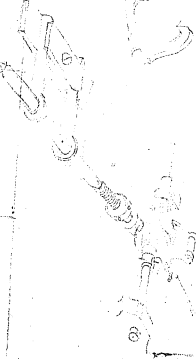
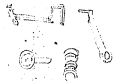
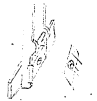


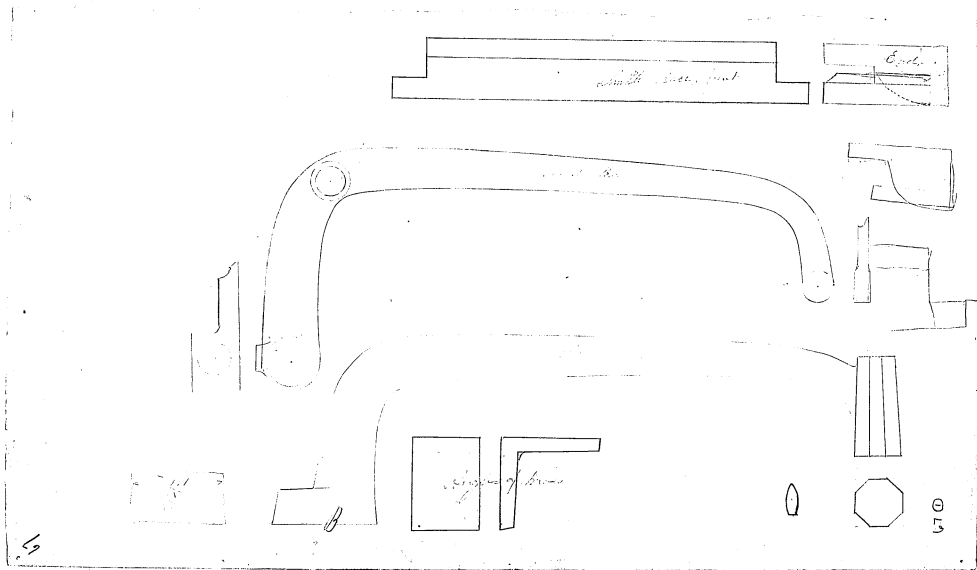
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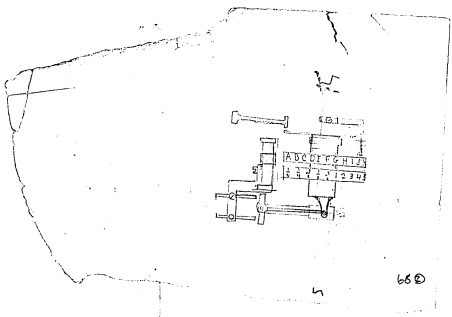
650

**99**





67

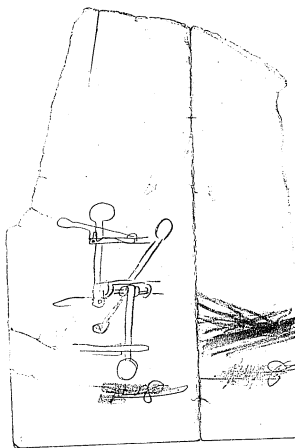
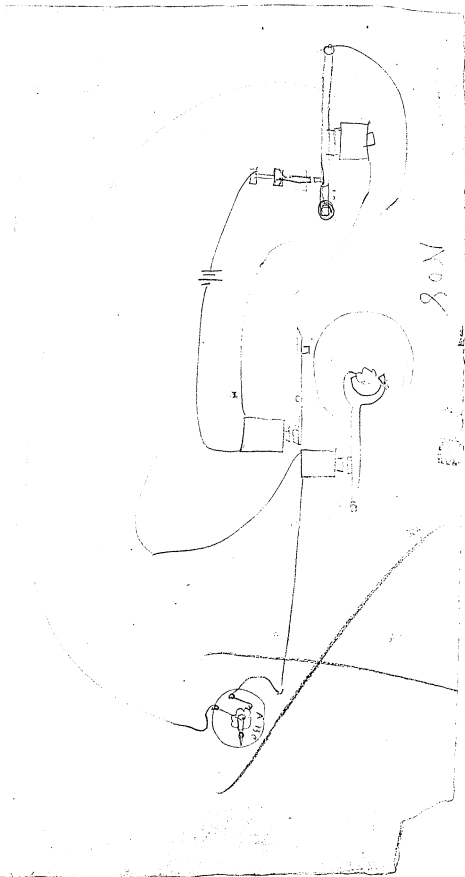


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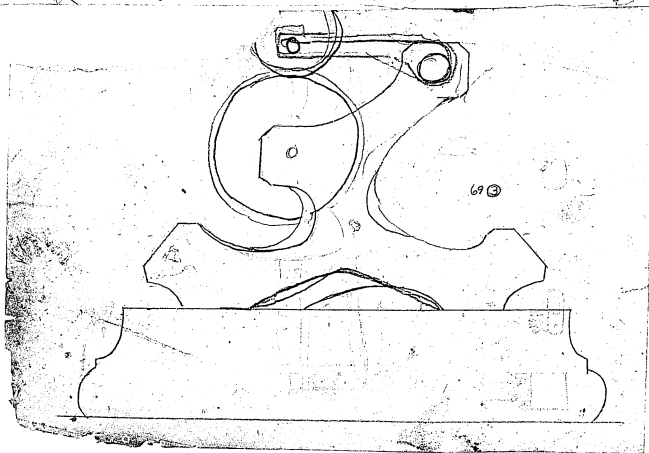
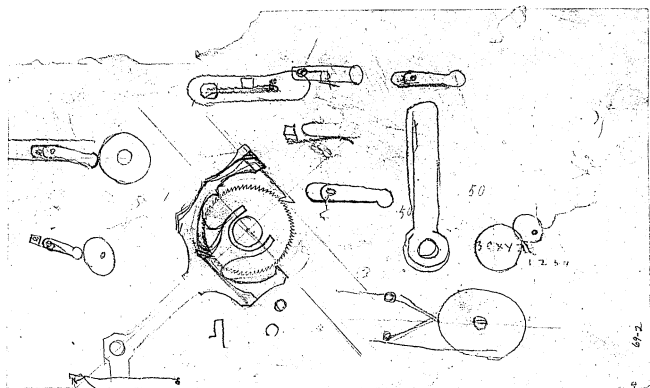
**68**

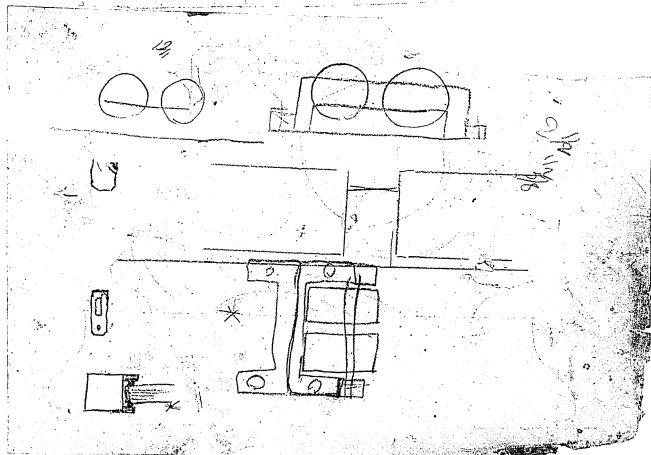
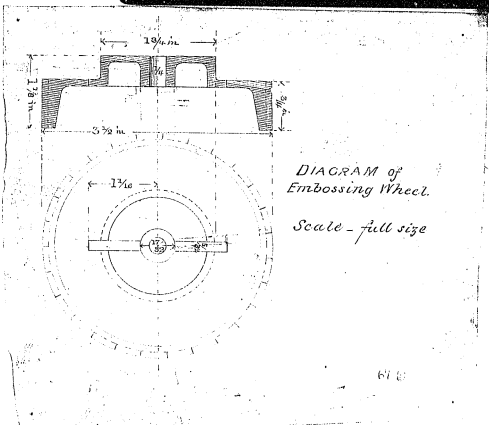
680

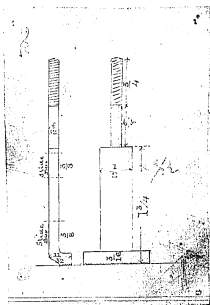




68

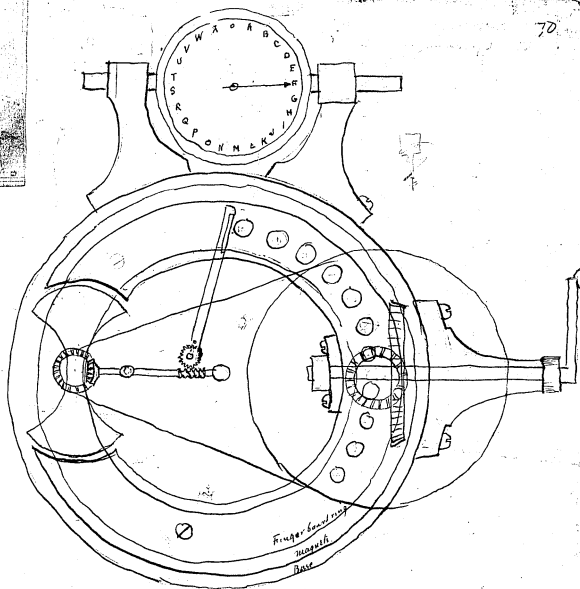






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Magneto Electro Telegraph Apparatus

Invented July 23 1870.

William

William Ayer  
 Austin Ayer  
 Andrew Hyatt

700

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245.

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26 = 64

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Elevation - 710



It avoids this way: Key 13 being closed; When Key a both relays of high adjustment avoid; When Key 13 and avoid a, both relays of low adjustment avoid a piece.

71

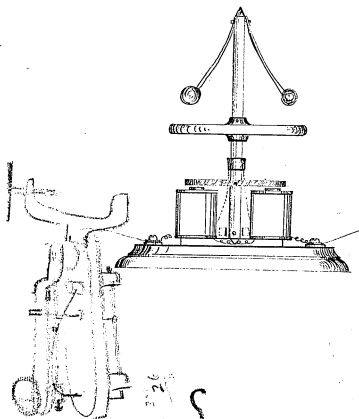
0 0 1 3 4

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3  
2  
1  
7-11-4  
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ASB JHOA KAD DAD EDO FID GAS HGS JIR JGT HSO PLS MMS SIB OIB P OT QOI RJO SLS PLS UTO V OI WGS XOI Y OI Z OI

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45  
35  
25  
15  
10  
5  
2  
1

71

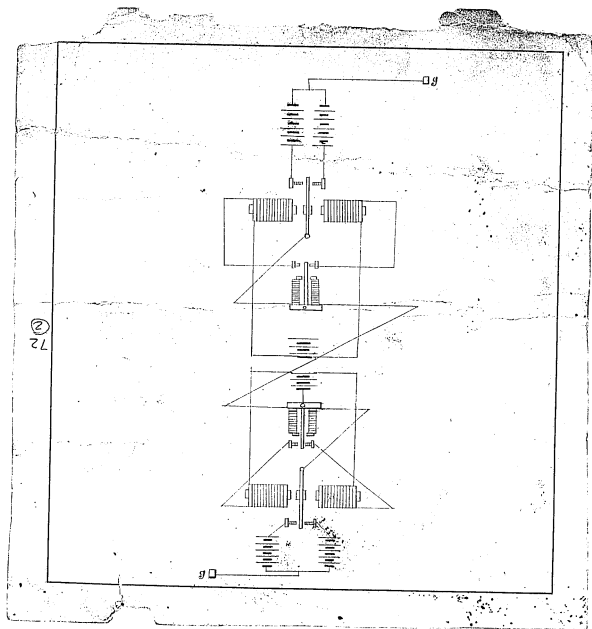


1888 26

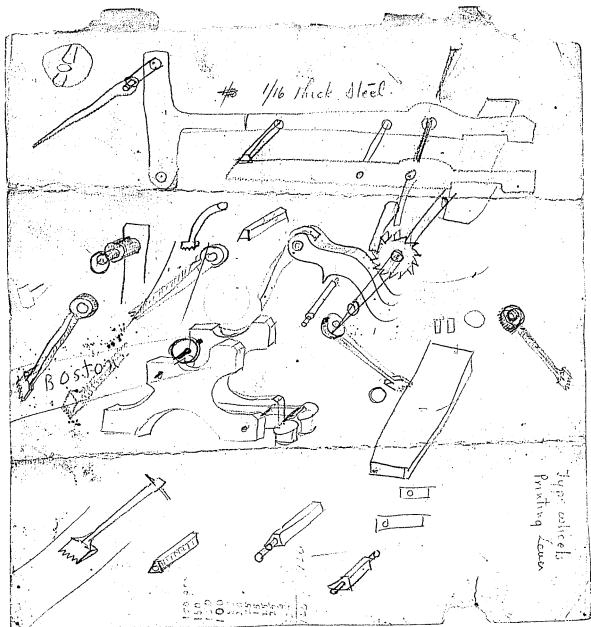
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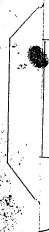
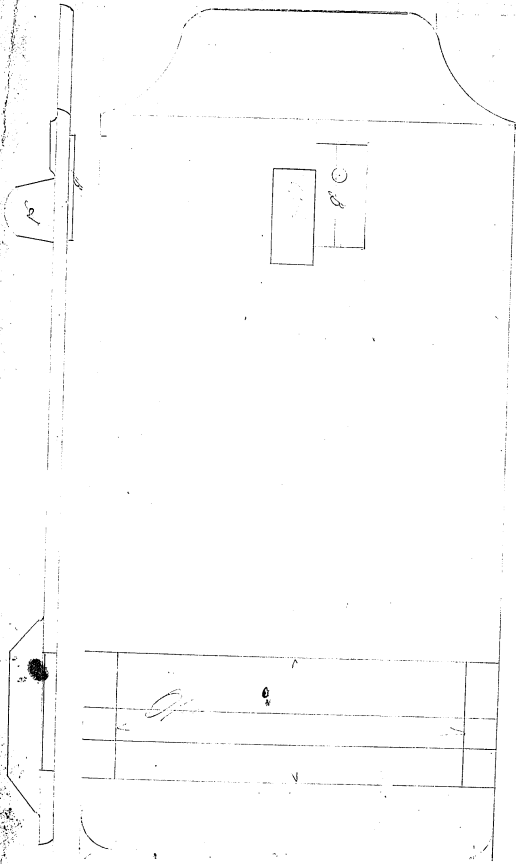




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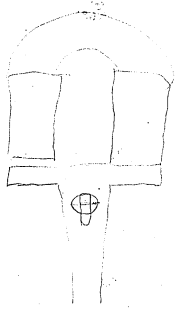


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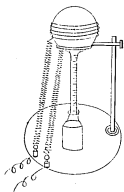
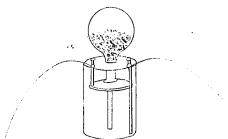


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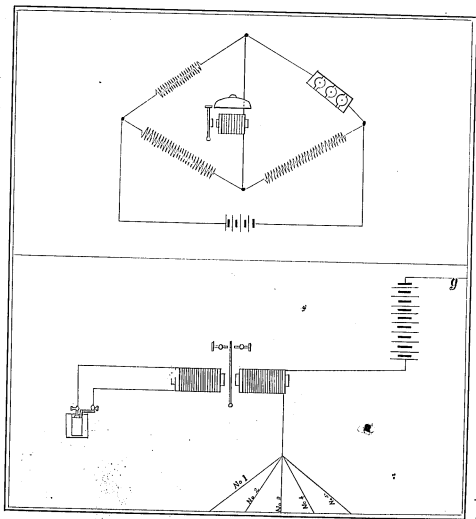
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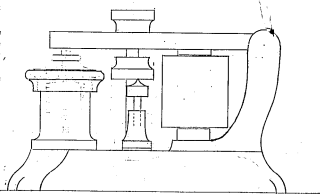
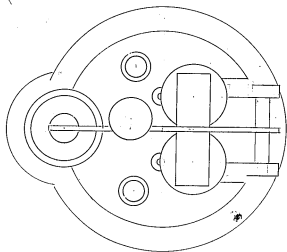
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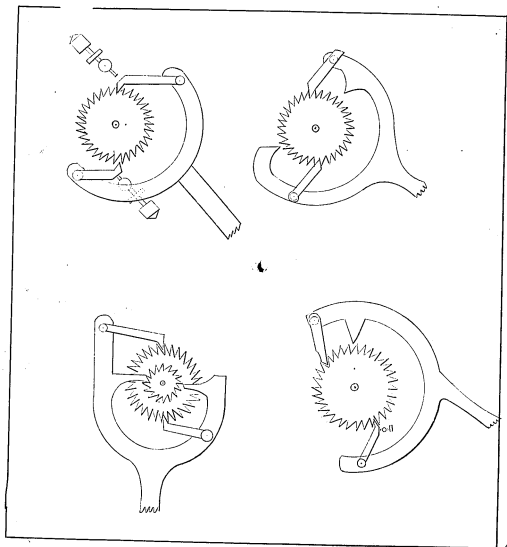
74



150



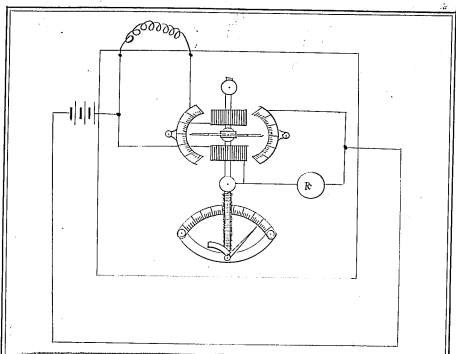
75



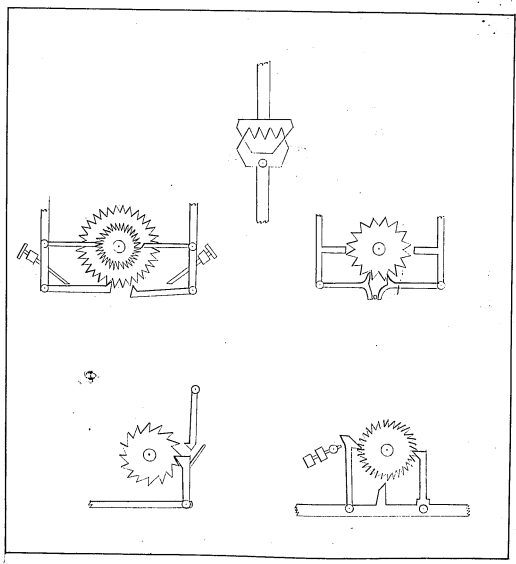
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09L



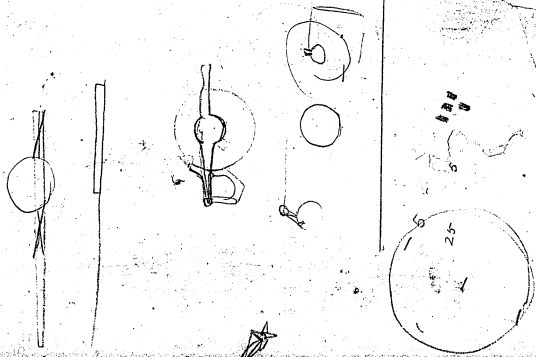
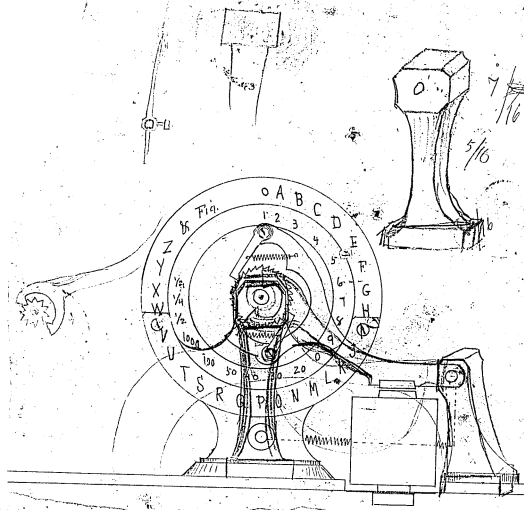
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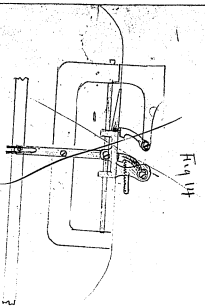
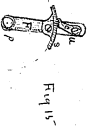
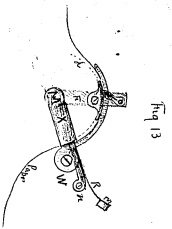


Fig 14

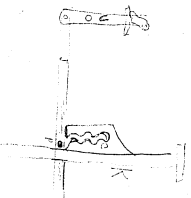


Fig 15

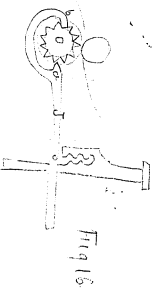


Fig 16

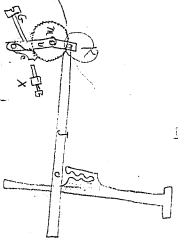


Fig 17

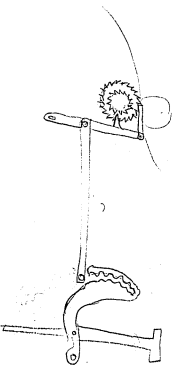


Fig 18

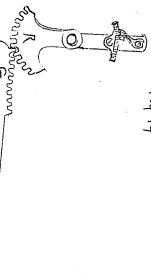
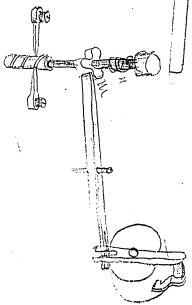
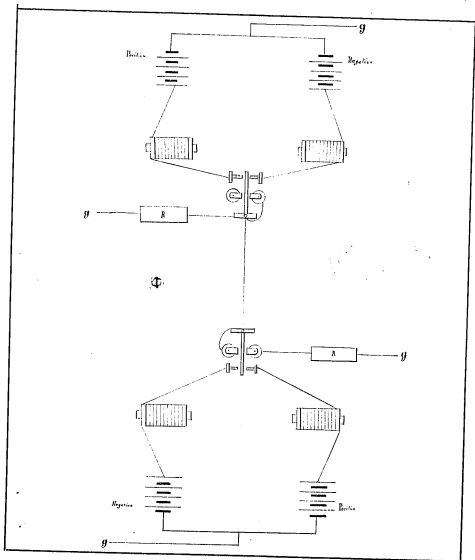


Fig 19

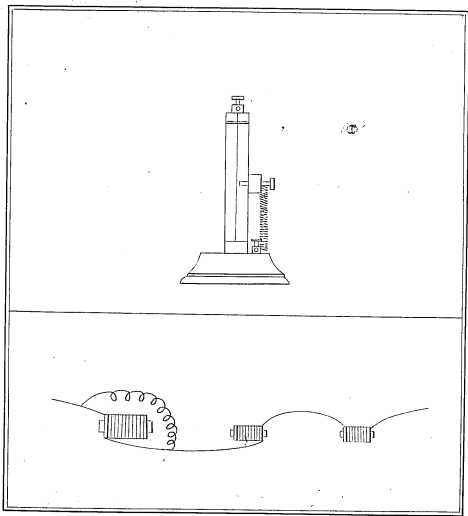


79



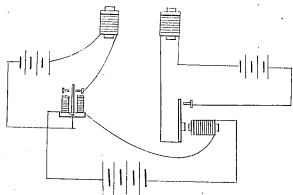
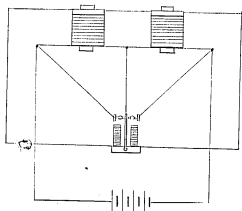
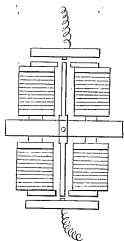
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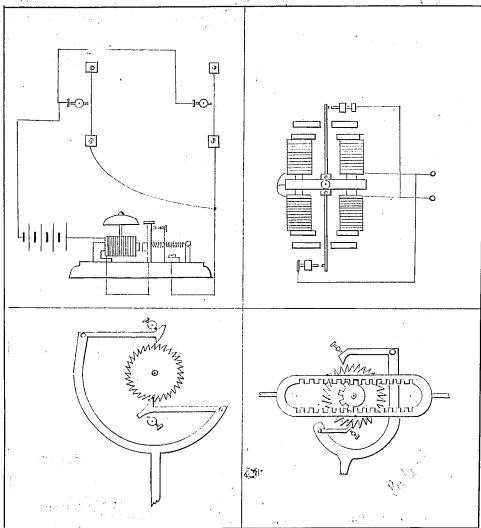
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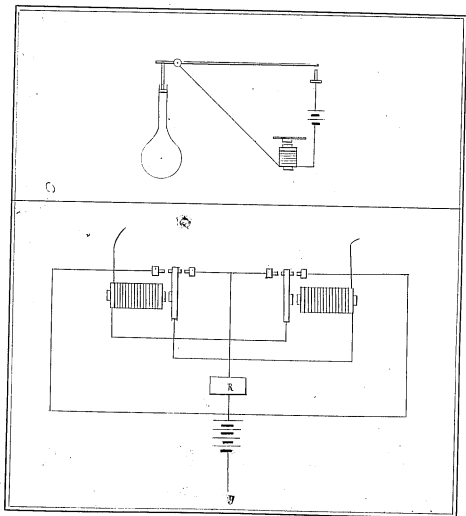
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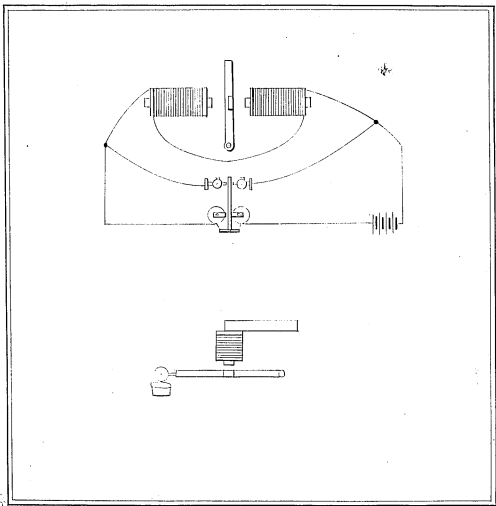
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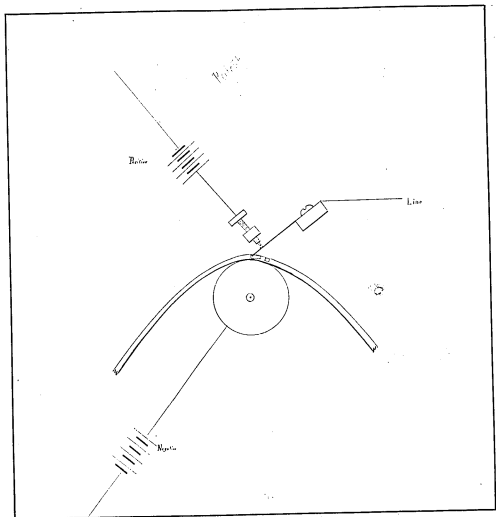
01b



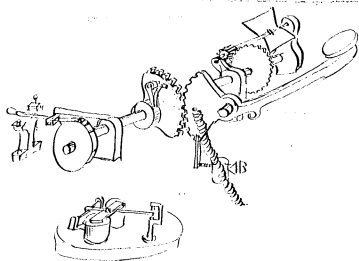
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32 (2)

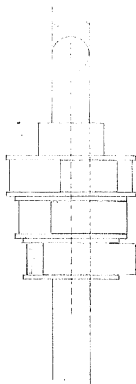
Boston Arrived

Machine

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BOST



BOSTON

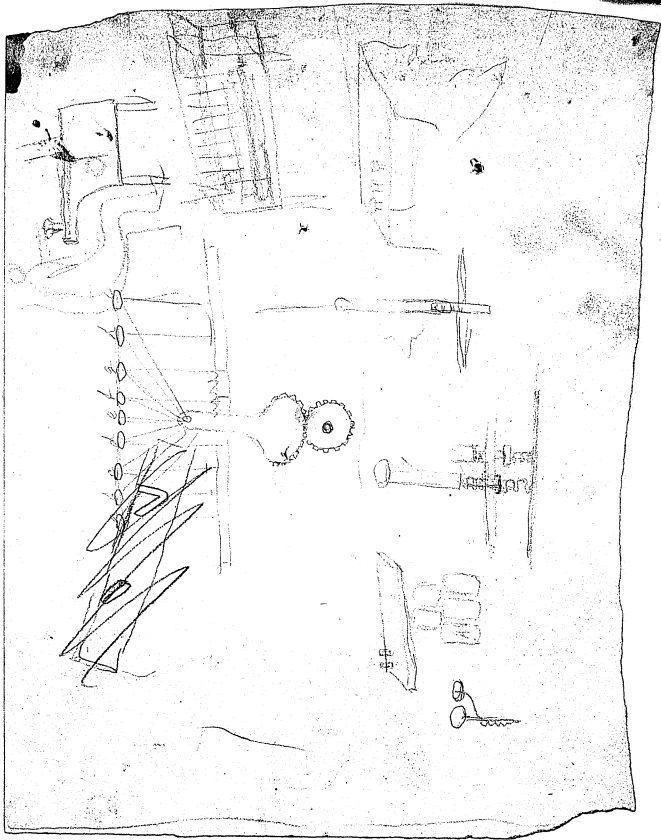
BOSTON

BOSTON.

Press Letters

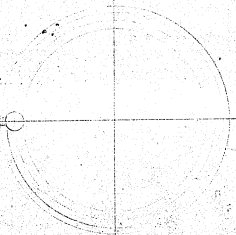
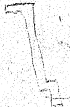
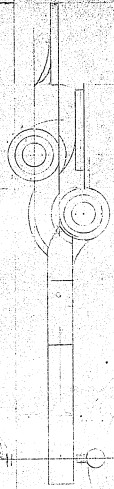
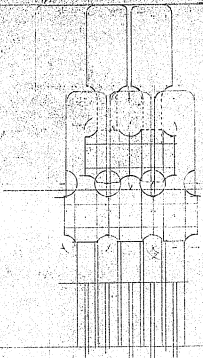


830



84

○  
△

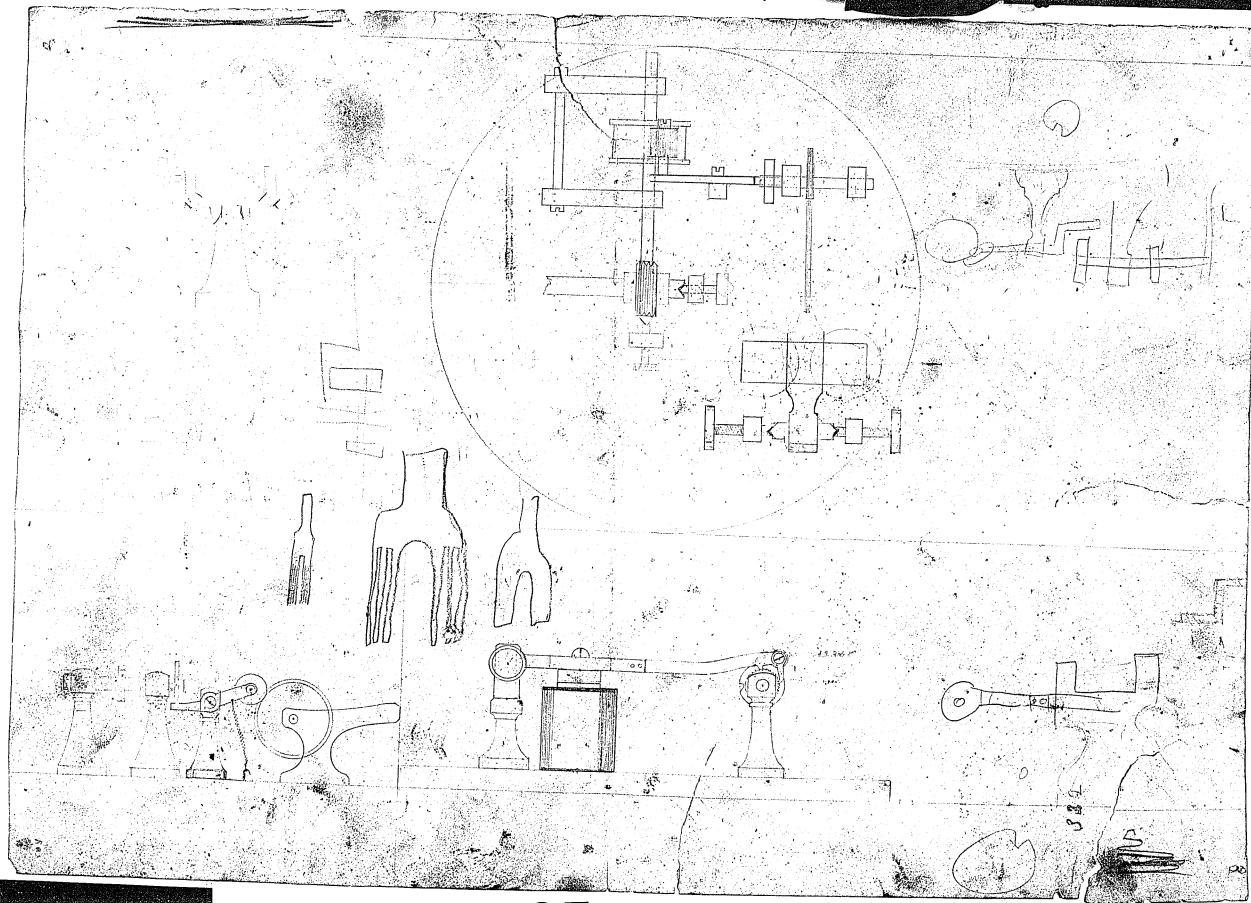


84

3/8 fls

center of fls

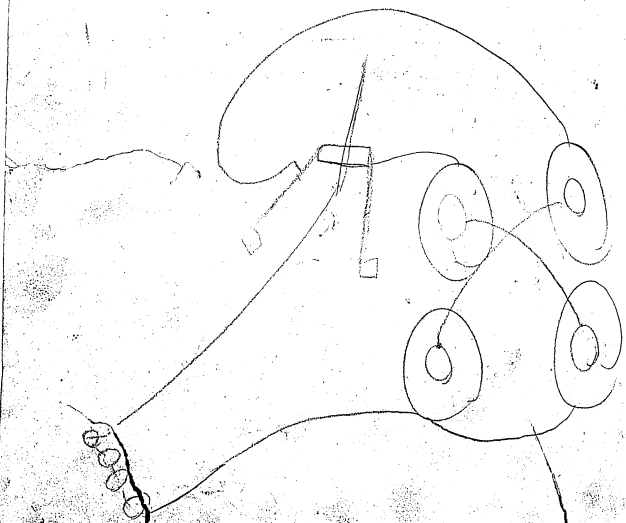
84 0

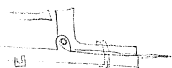
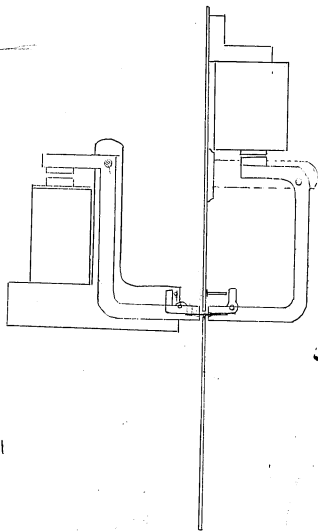


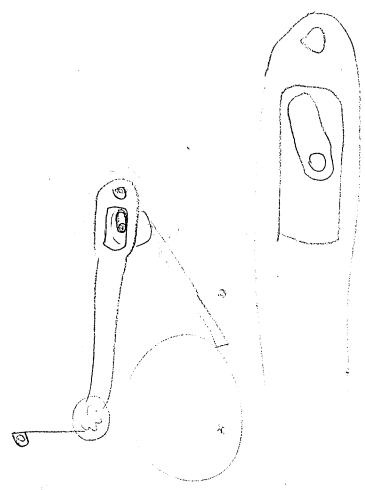
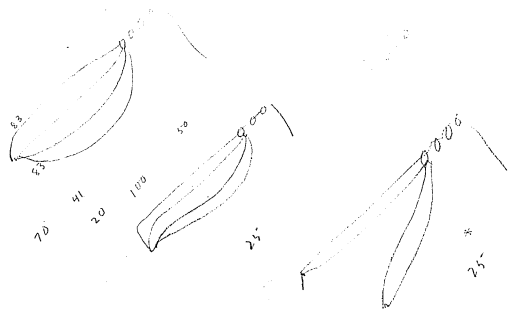
058

as. alt.  
co. alt.

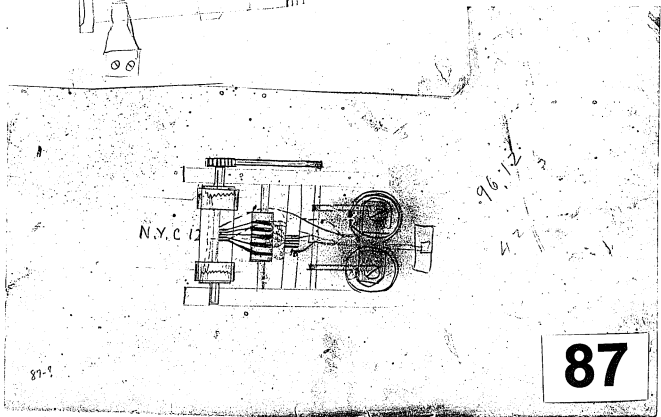
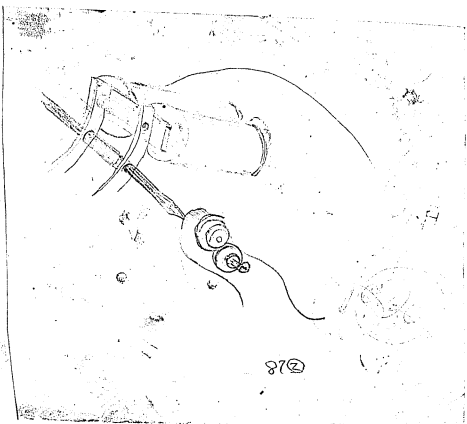
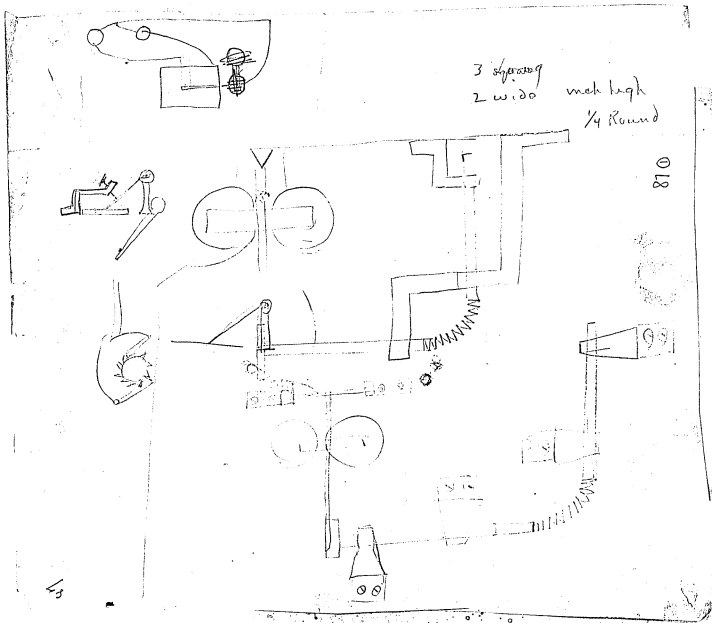
81  
29 281  
1 38 69  
287  
487  
26  
29

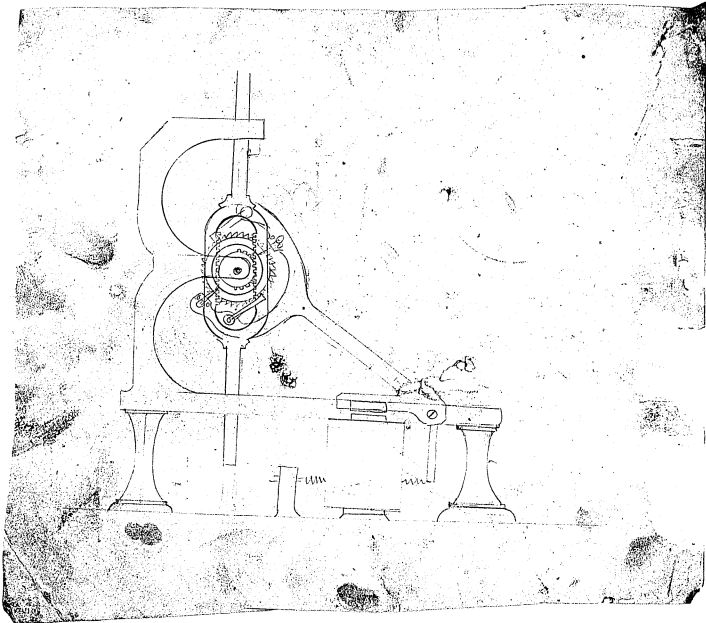








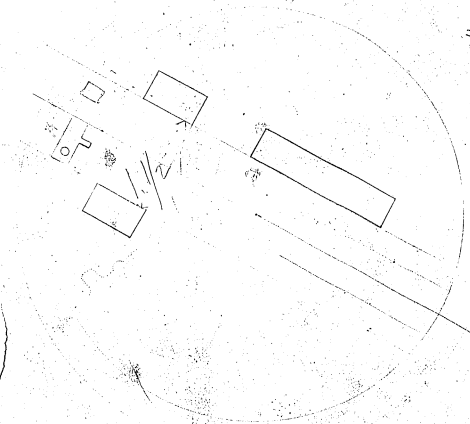
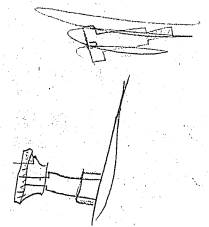




87

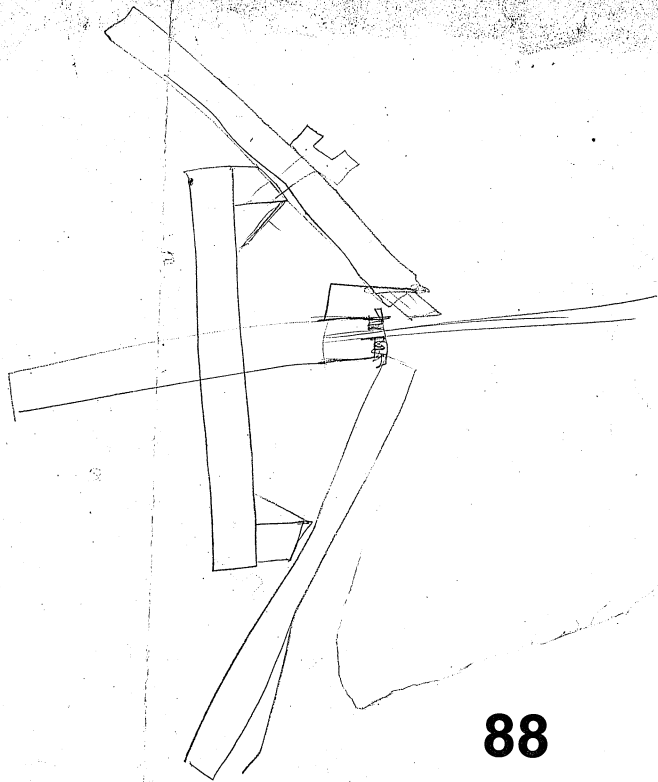
22  
24  
26  
28

9/6

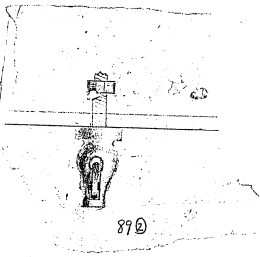
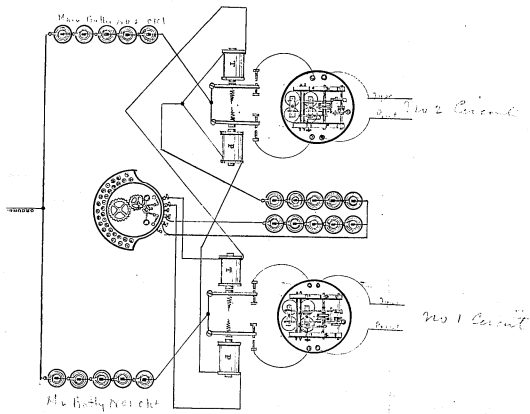


88

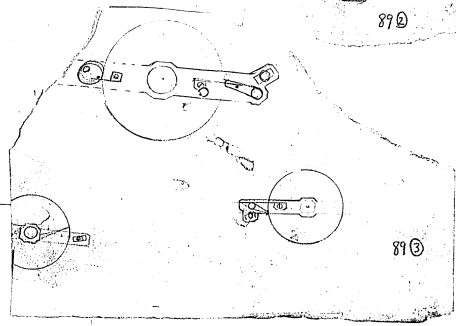
880

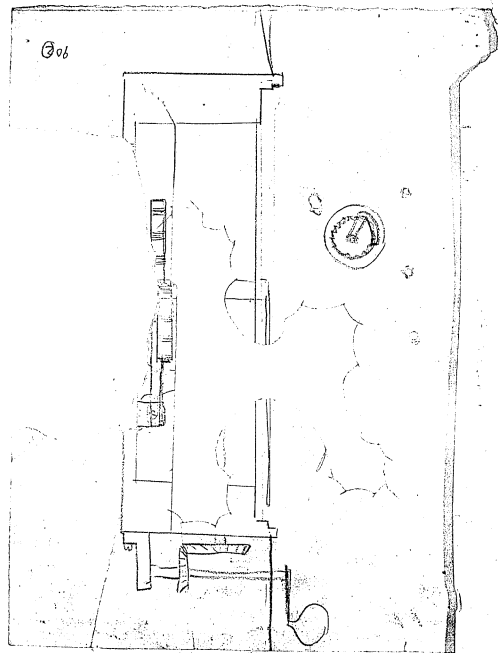


89



3 pr 1114  
BOSTON  
E WAB  
12 5 1



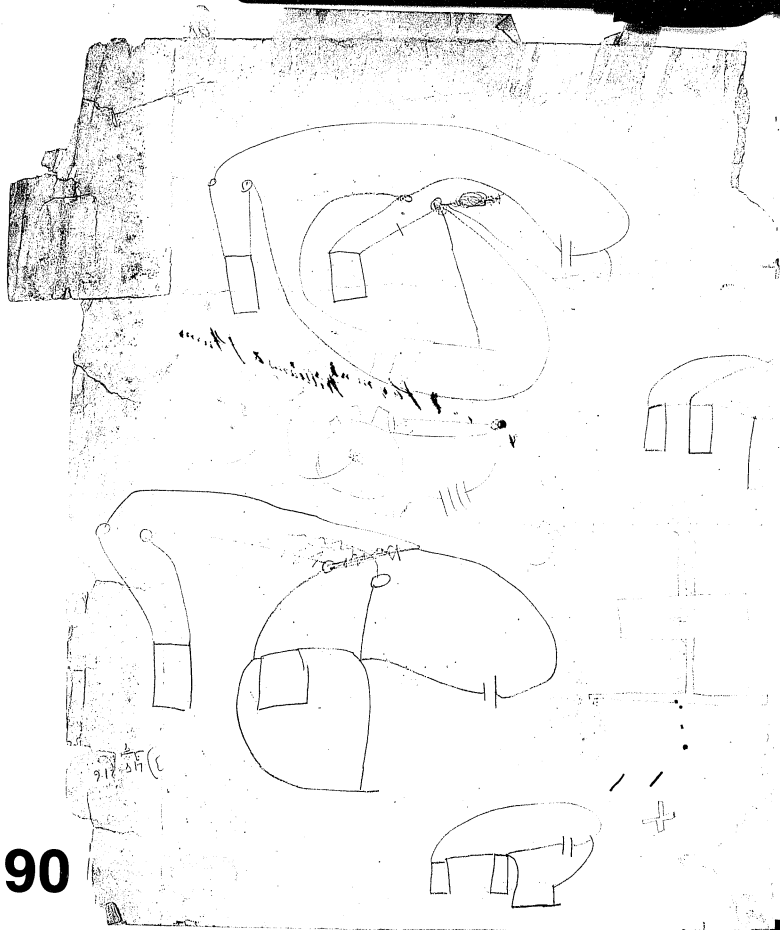


90

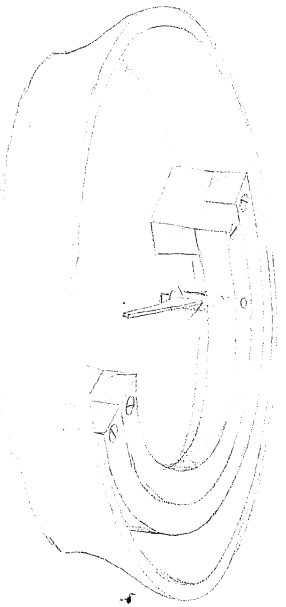
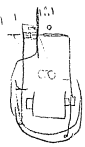
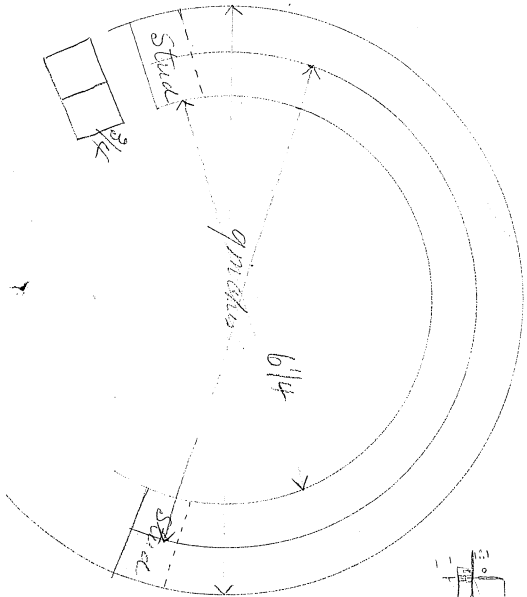


900

90



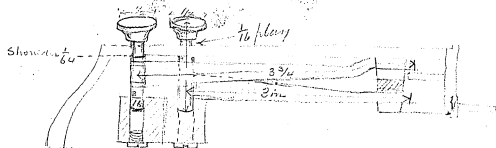
91



00

9





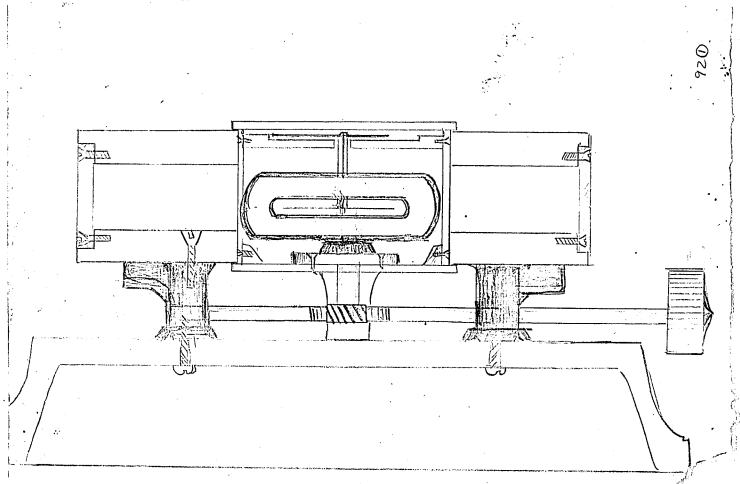
Make joint  
with tape for this



016

91

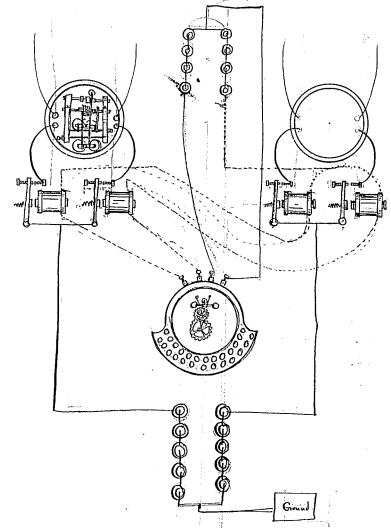
2/11/54



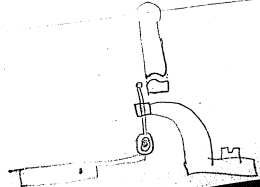
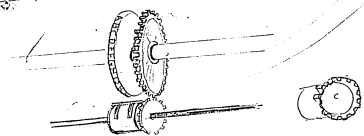
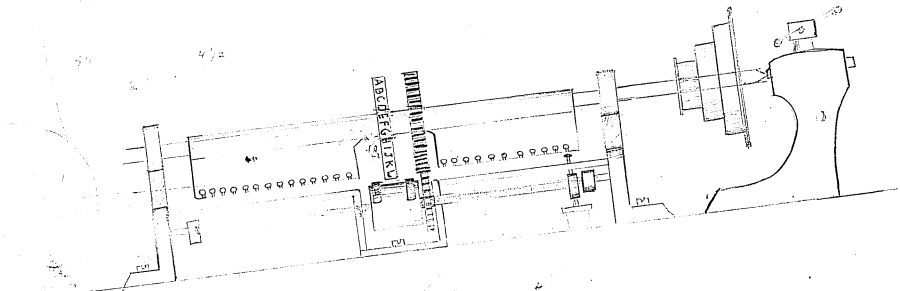
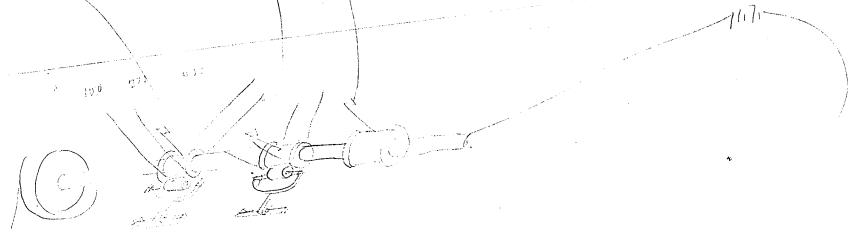
920.

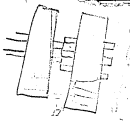
926

92



00



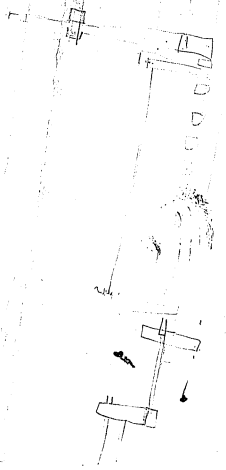
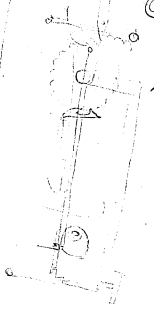


Selli  
Selli  
Selli  
Selli

Grundstand  
Grundstand  
S. 109 1/2  
S. 109

M. G. für 1000

Christen  
S. 175  
S. 275  
S. 275



Medien  
Calle Calanetta  
Calle Calanetta  
Selli Selli

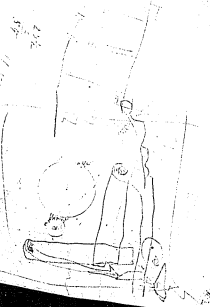
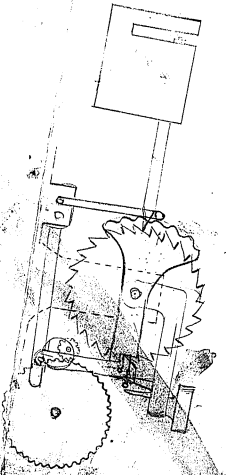
Handy telegraph  
Telegraph

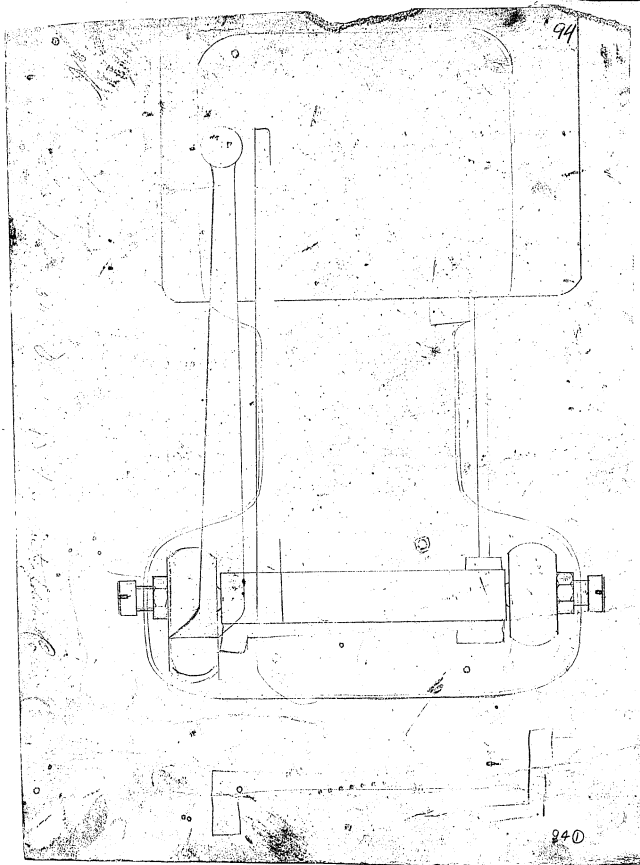
Offiziers Pension  
Pension

Christen  
Christen

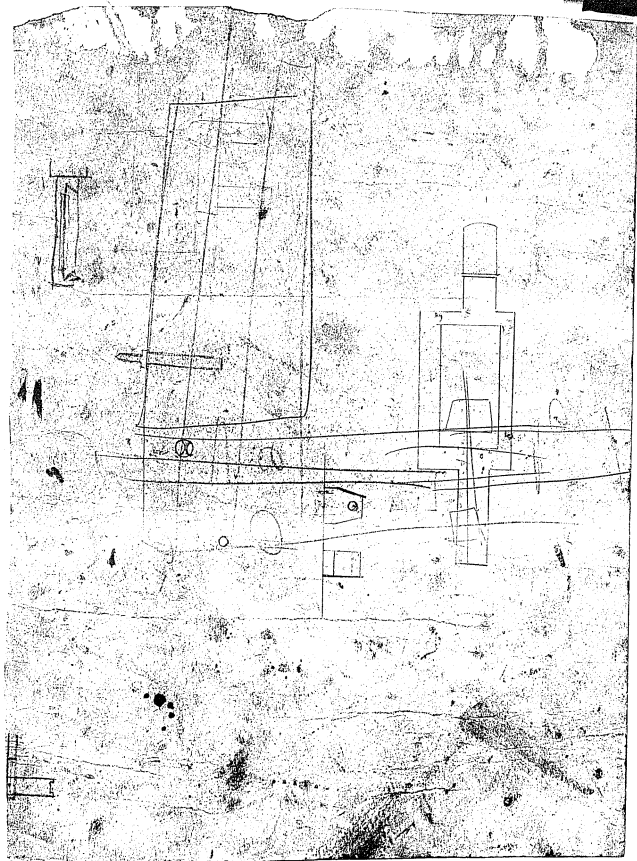
930

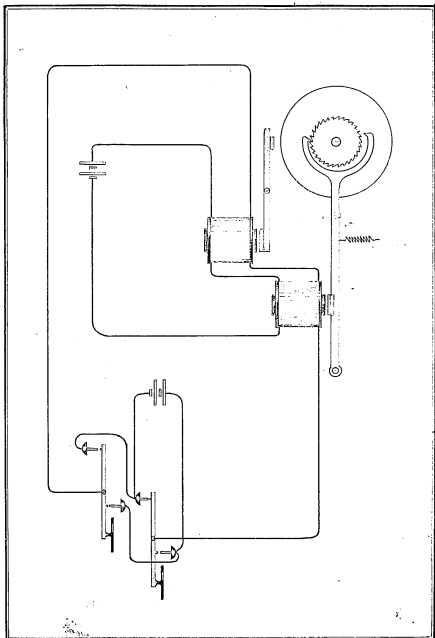
93





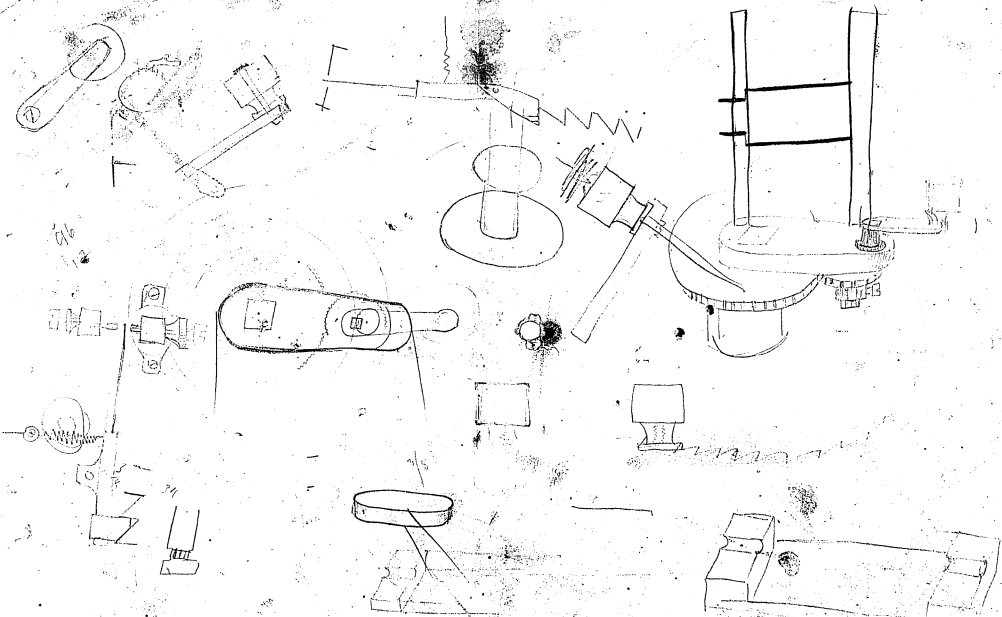
94





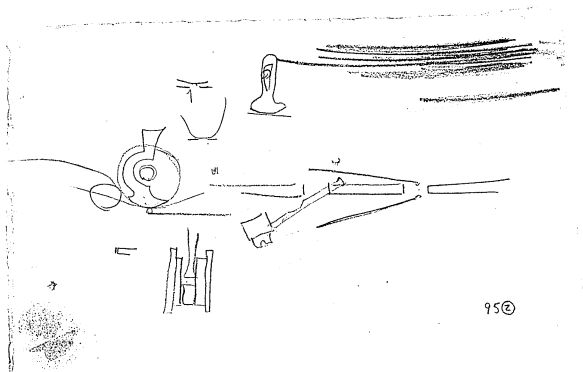
94  
②

94



95

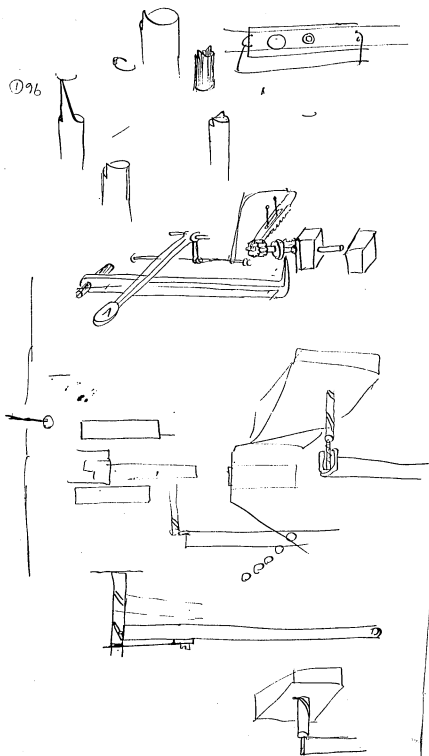




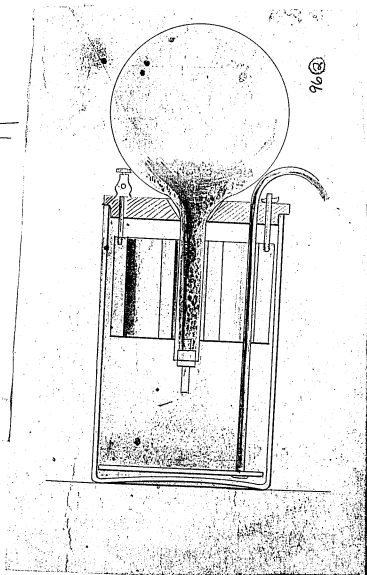
95②

95

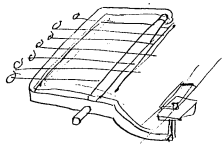
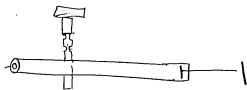
① 96

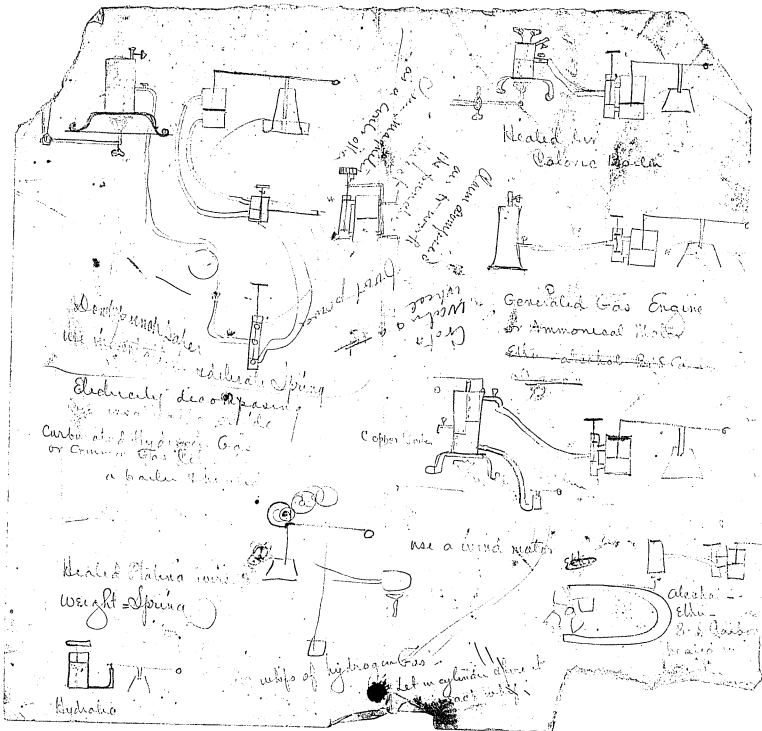


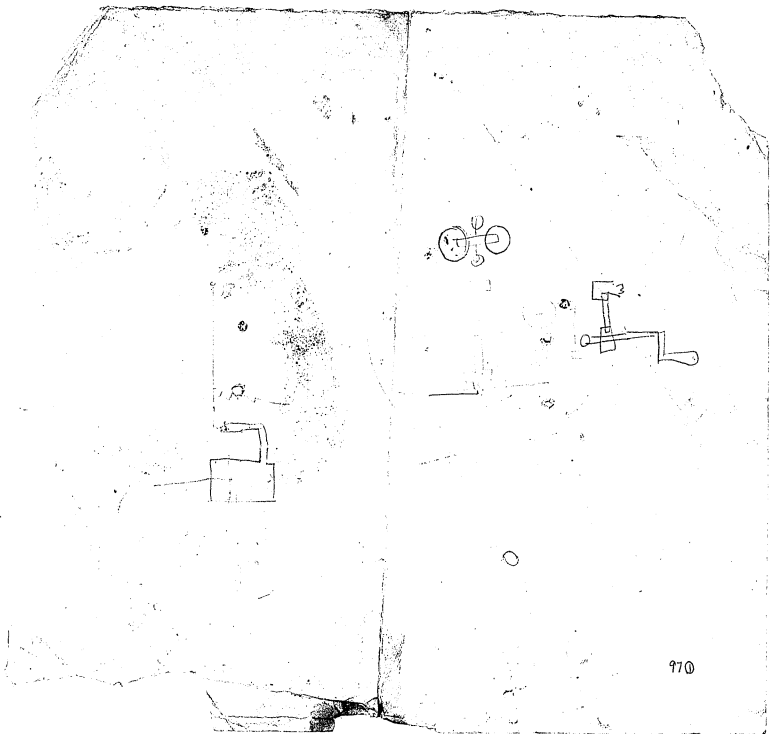
96 ②



96

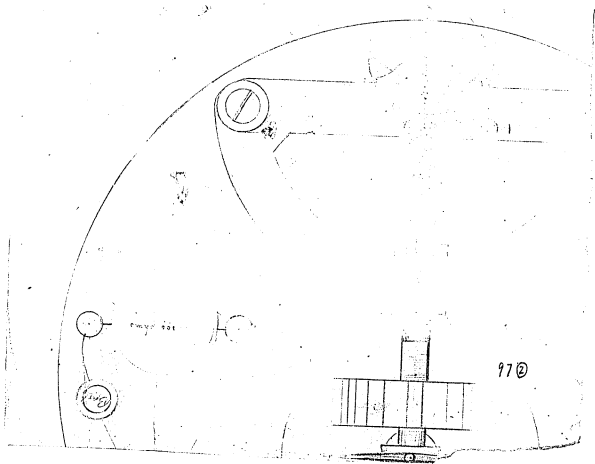




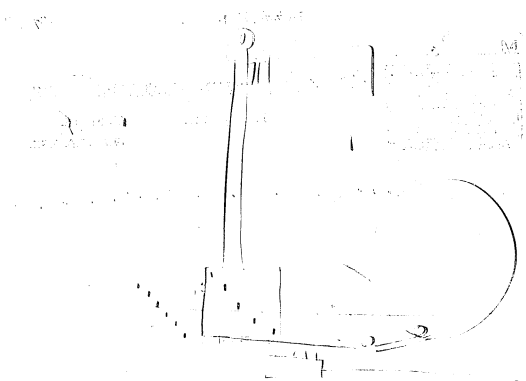


970

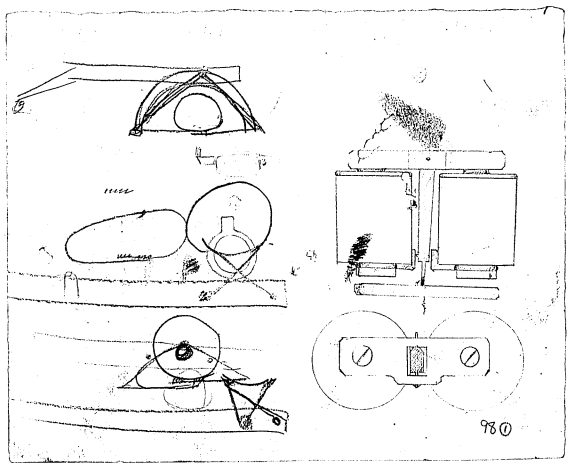
97



97

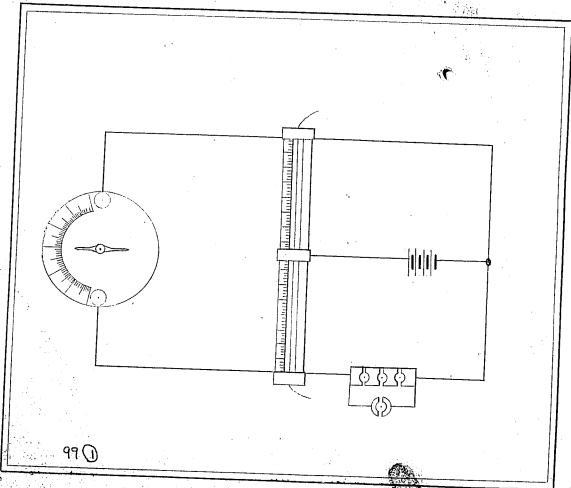


98②



98①

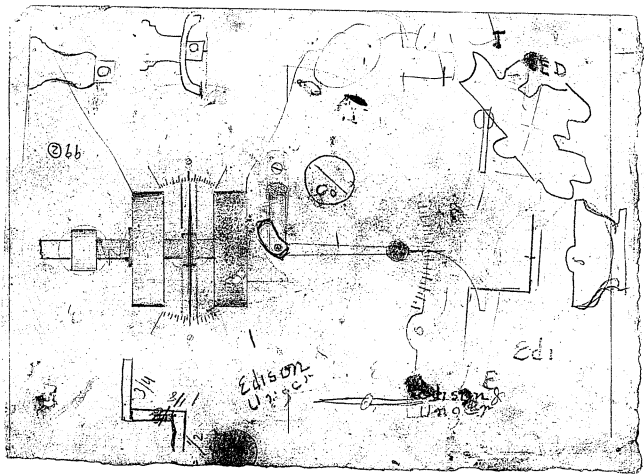
99

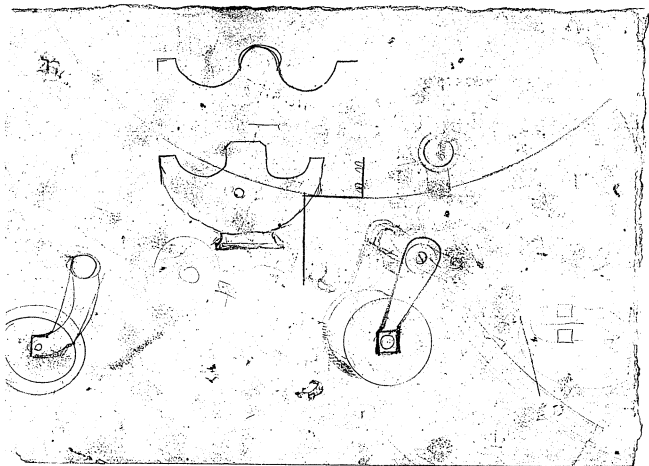


99 ①

99





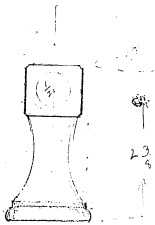


99

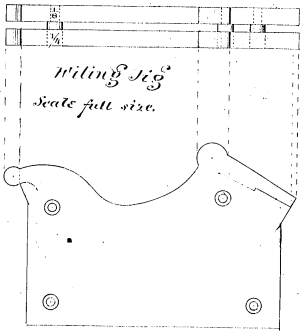
$\frac{3}{4}$  inch

$\frac{1}{4}$  inch

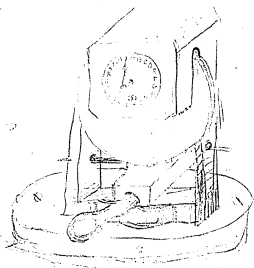
top 7/8 square  
actual size



(200)



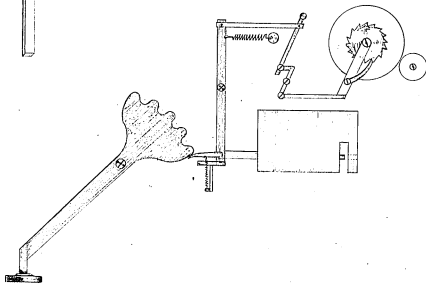
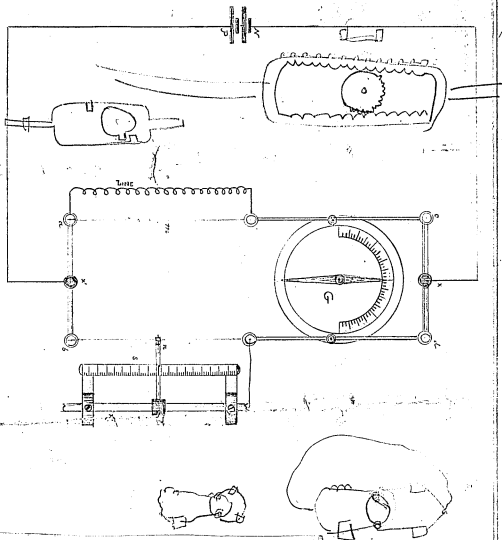
100



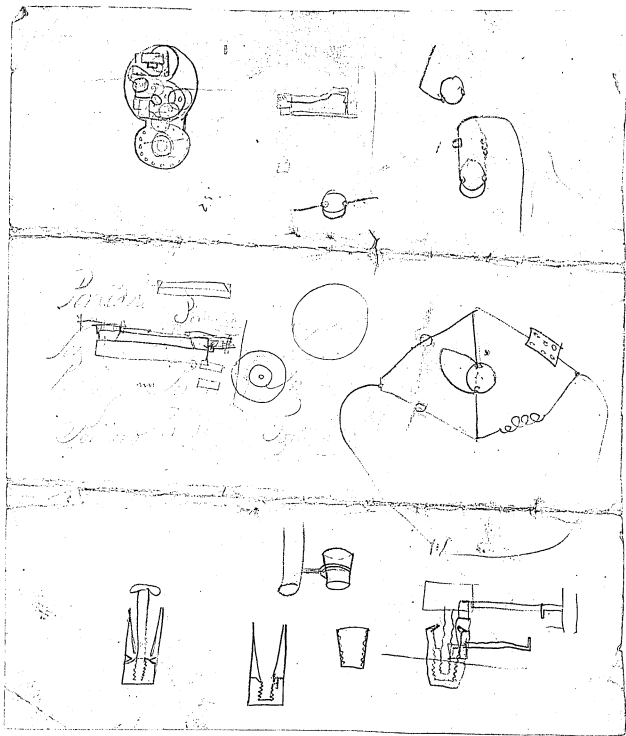
1000

**100**

101



101



101

FIG 31

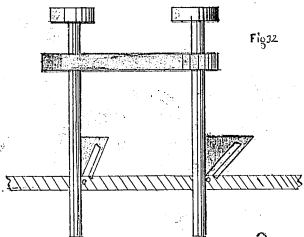
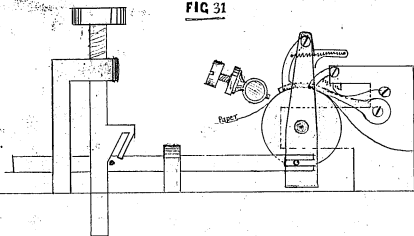


Fig 32

Fig 33

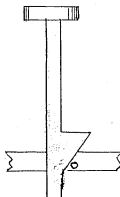


Fig 35

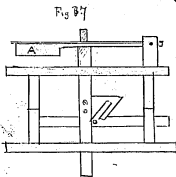


Fig 37

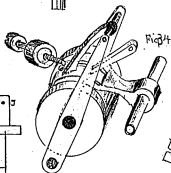


Fig 34

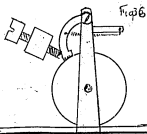
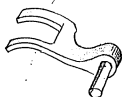
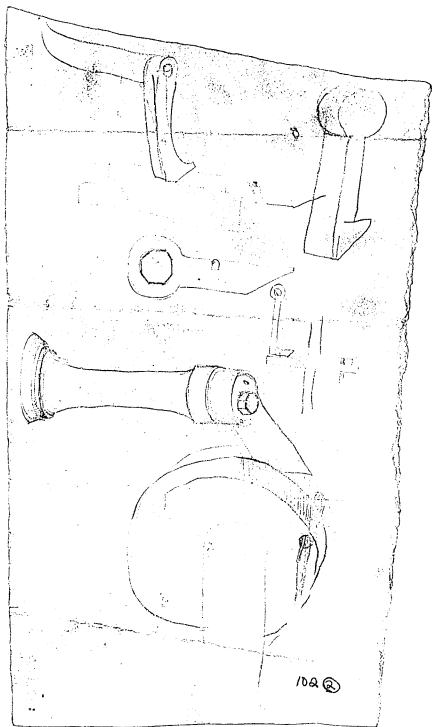


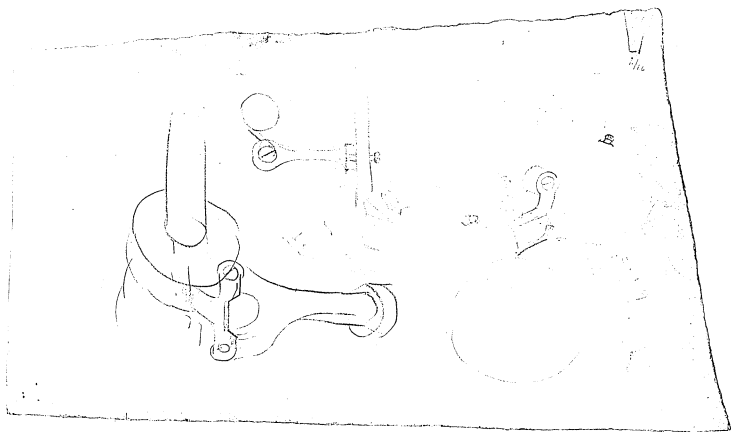
Fig 36

102 ①

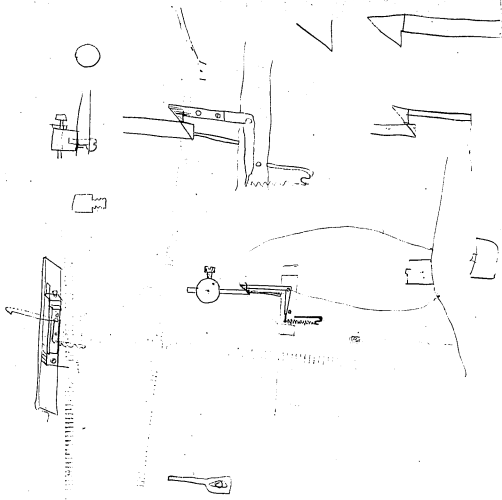


102



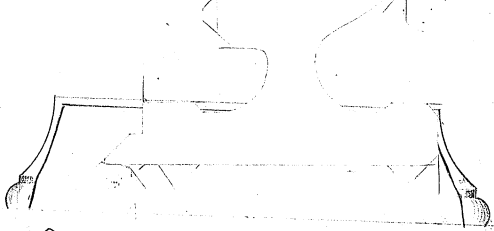


103



103 (1)

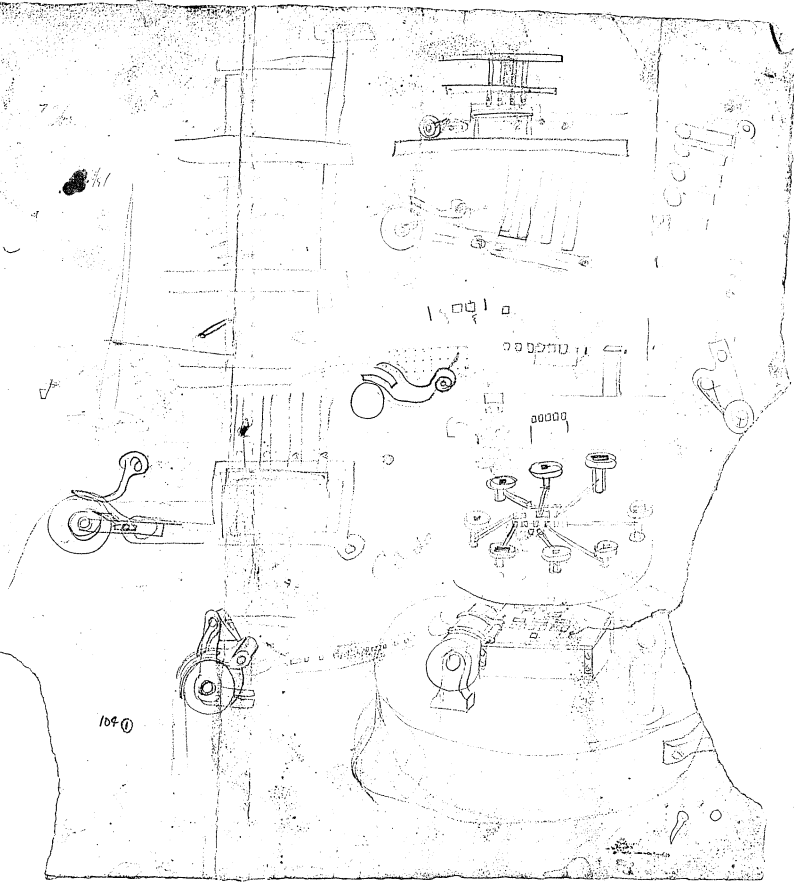
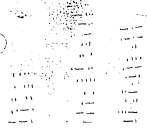
Please make pattern for Base - the drawing is actual size - have sharp corners and do not get pattern thinning



103 (2)

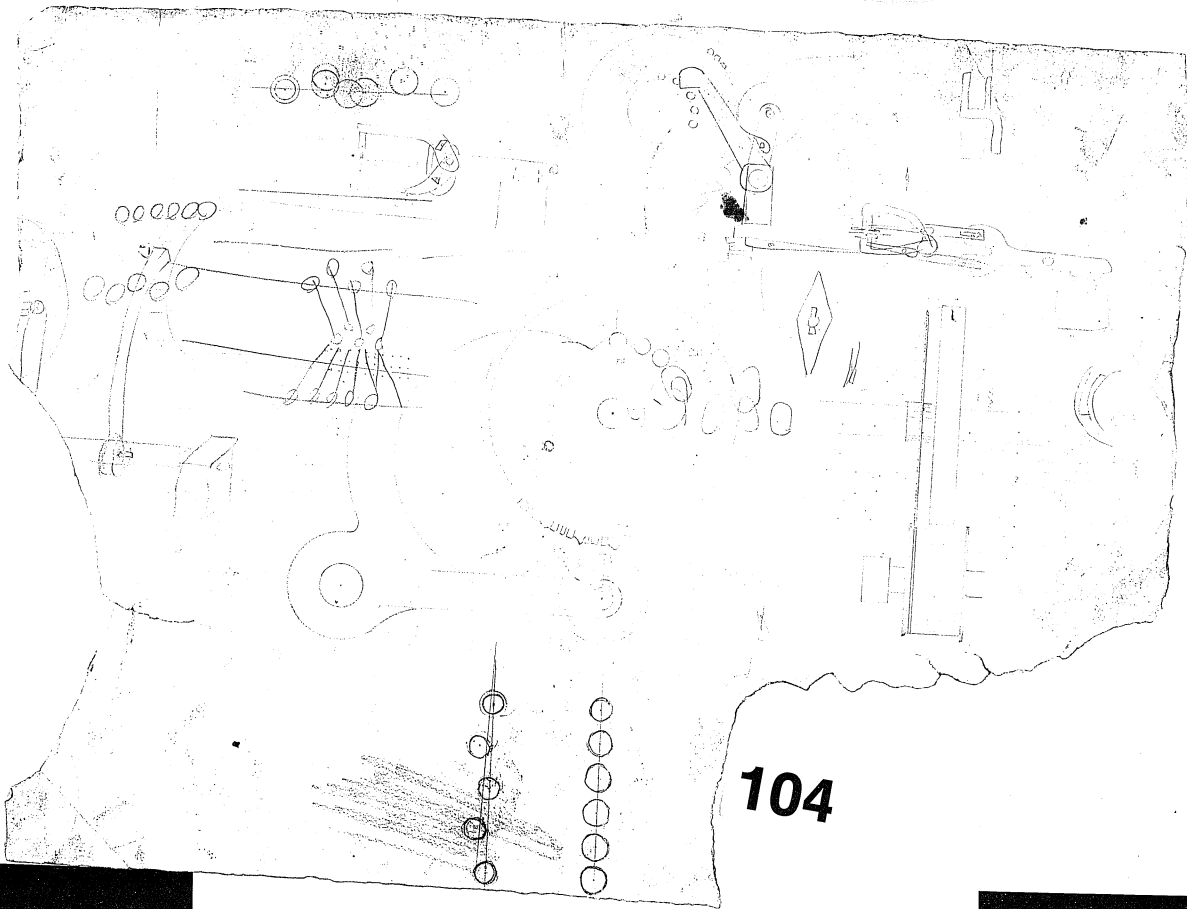
103

ABDORF  
KOPFSTADT  
1912



104

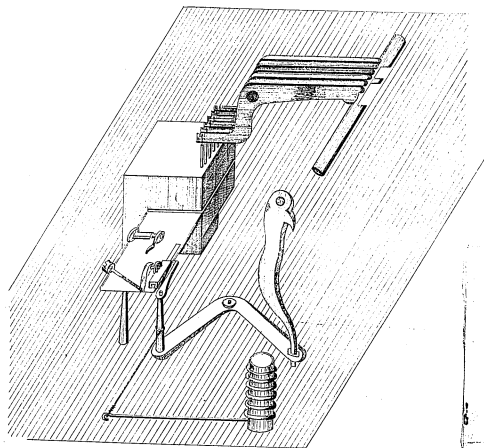
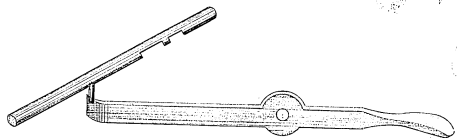
104



104

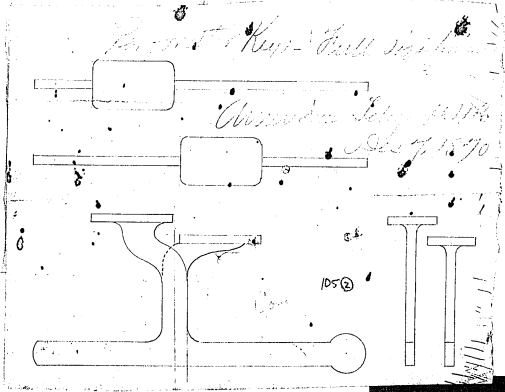
105

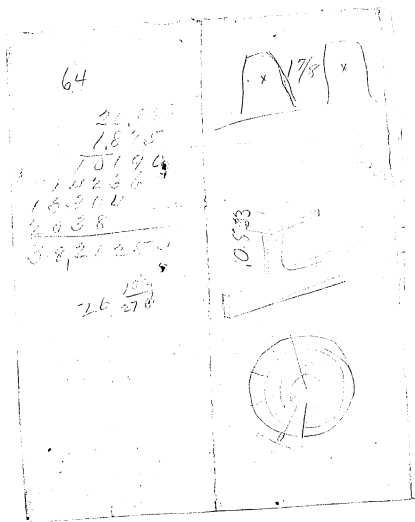
Referring to  
Figures

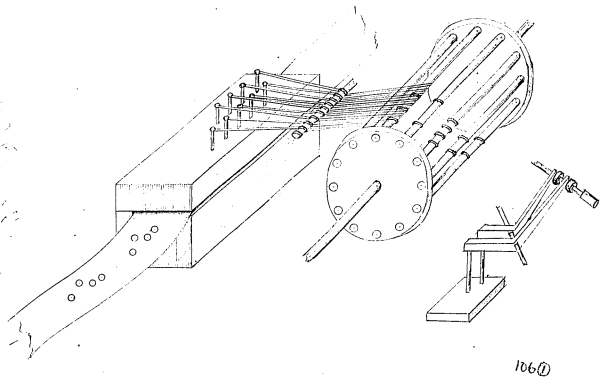
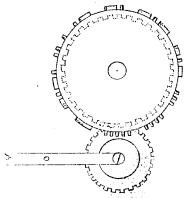
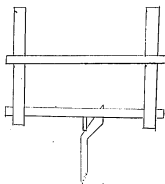


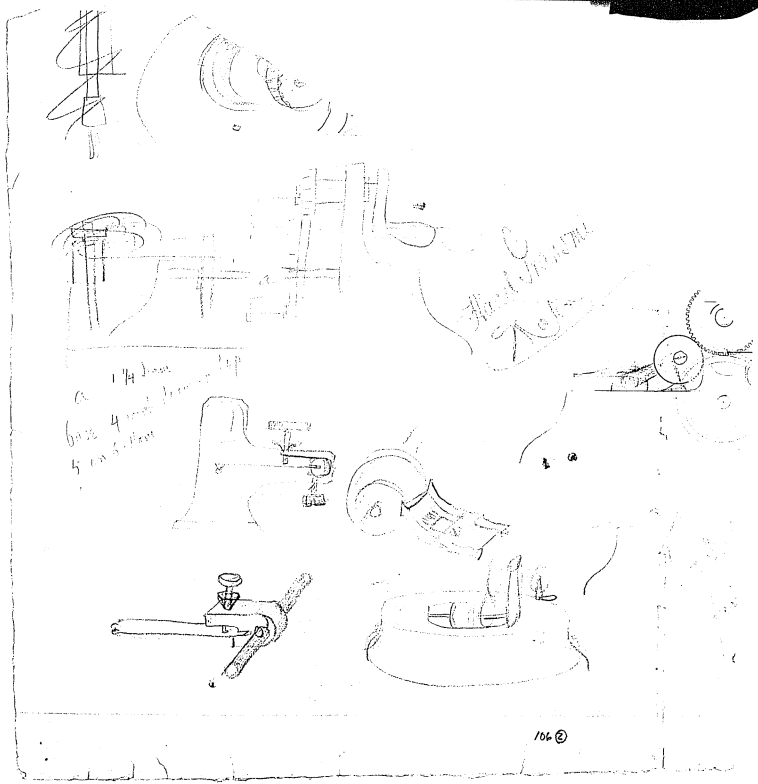
105 (1)

105





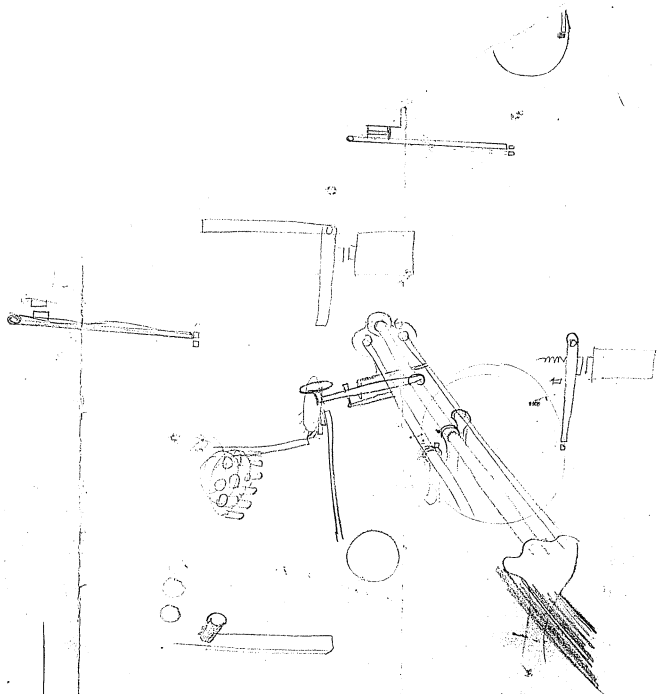




a 1/4 inch  
base 4 inch diameter  
5 inch long

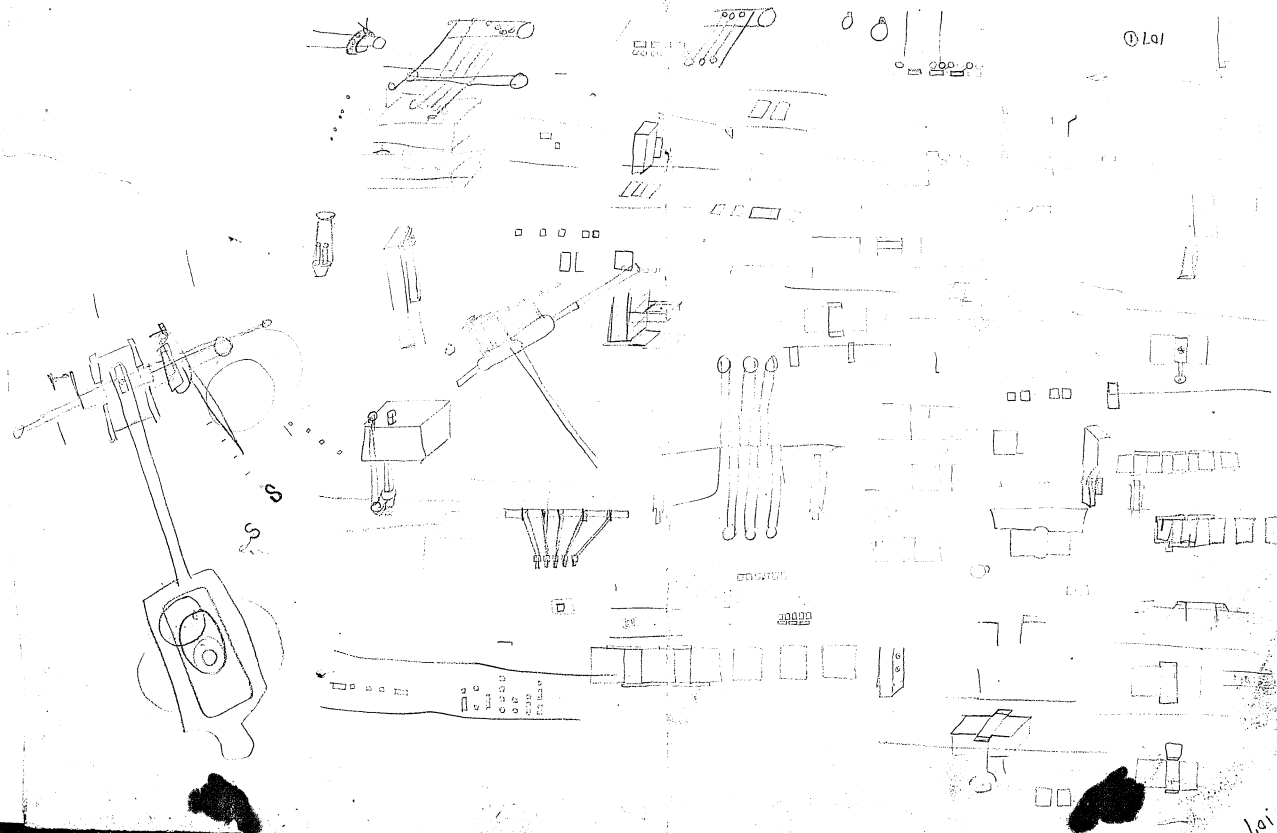
106 ②



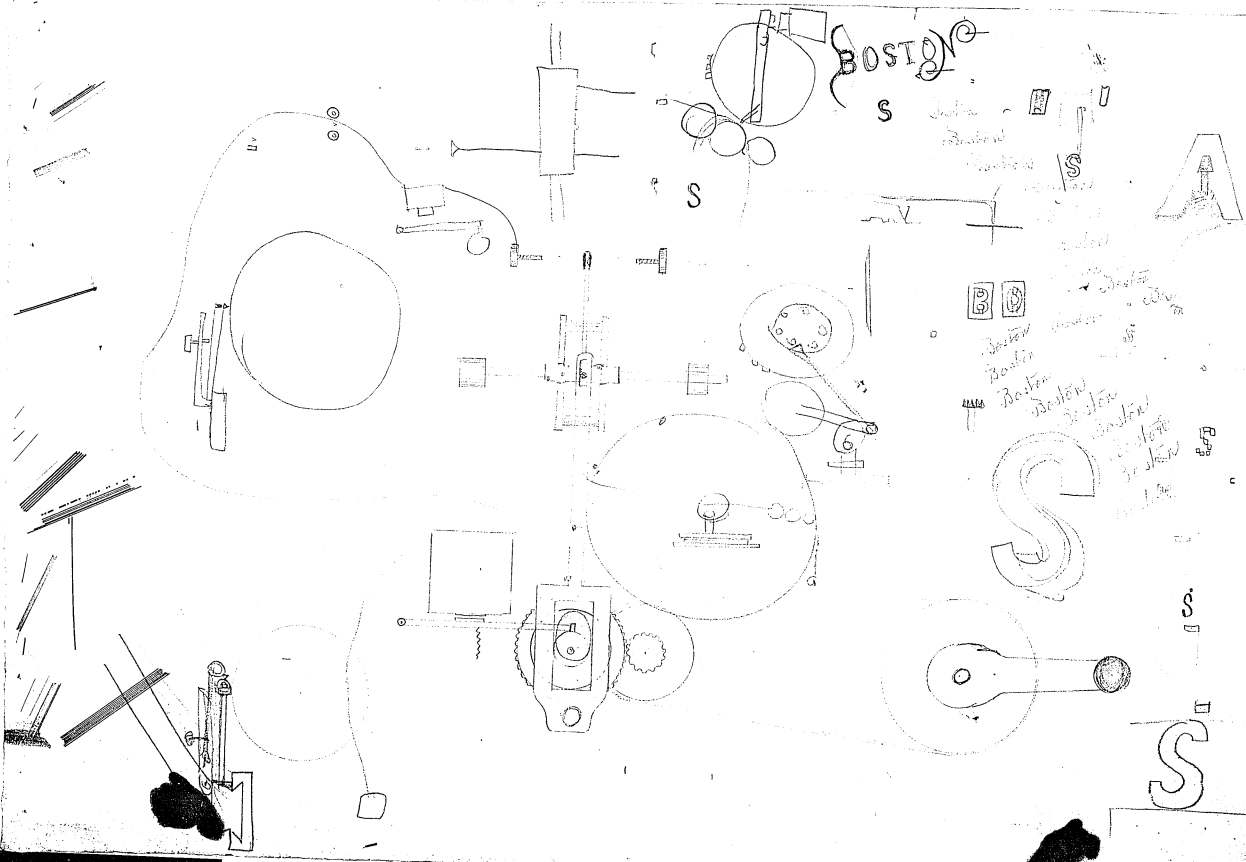


106

101



101

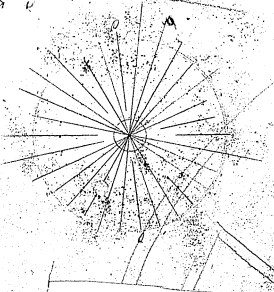


2101

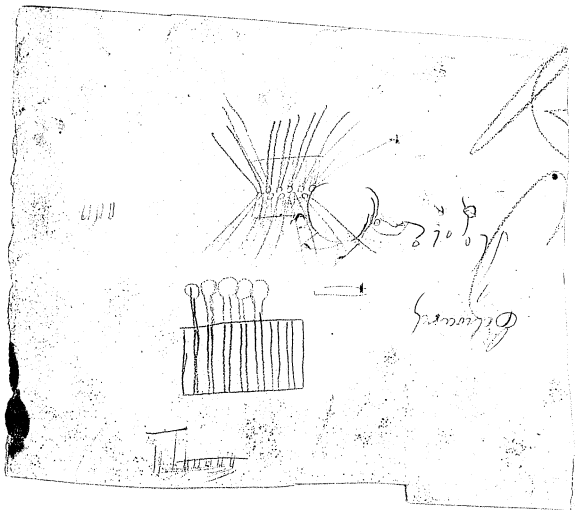
as in model except diameter of radiator  
• applied system for heating or ventilation



a v



107



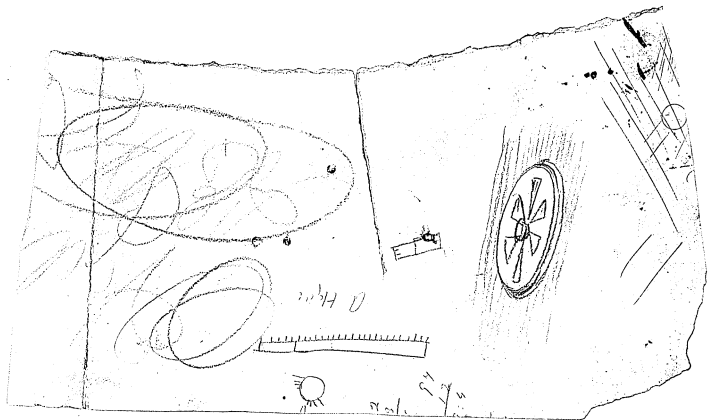
107



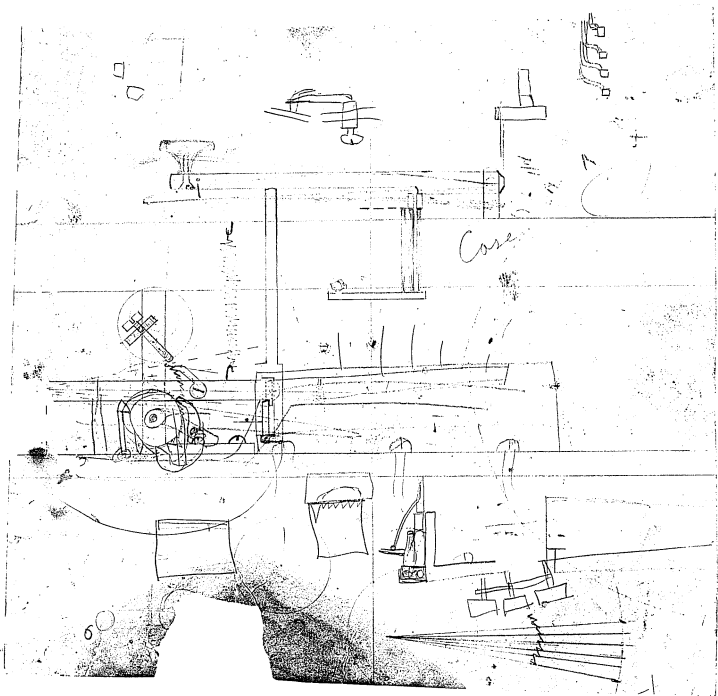
" thickness of face of pitch  $\frac{1}{8}$ "  
 " diameter of eye teeth  $\frac{1}{8}$ "  
 " inside gear so that root of tooth covers of  $\frac{1}{2}$  in  
 " gear of wrought iron strength of work edge wise  
 " annular and lever of thin steel  $\frac{1}{16}$ "  
 " shaft or drum larger  $\frac{1}{16}$ "  
 " suitable  $\frac{1}{16}$  less than  $\frac{1}{16}$ "  
 " preserve the relative proportions of all the working parts  
 " Bring whole thing within scribbles where it can be



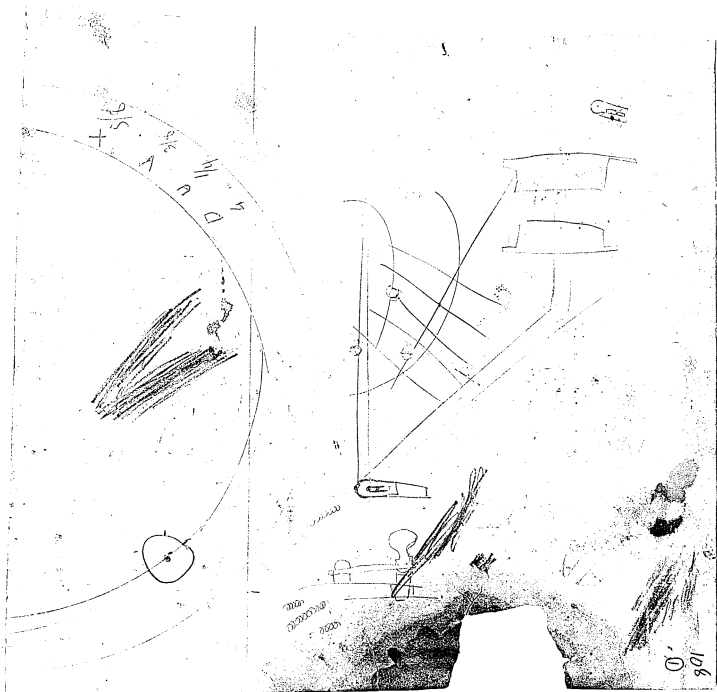
108②



108





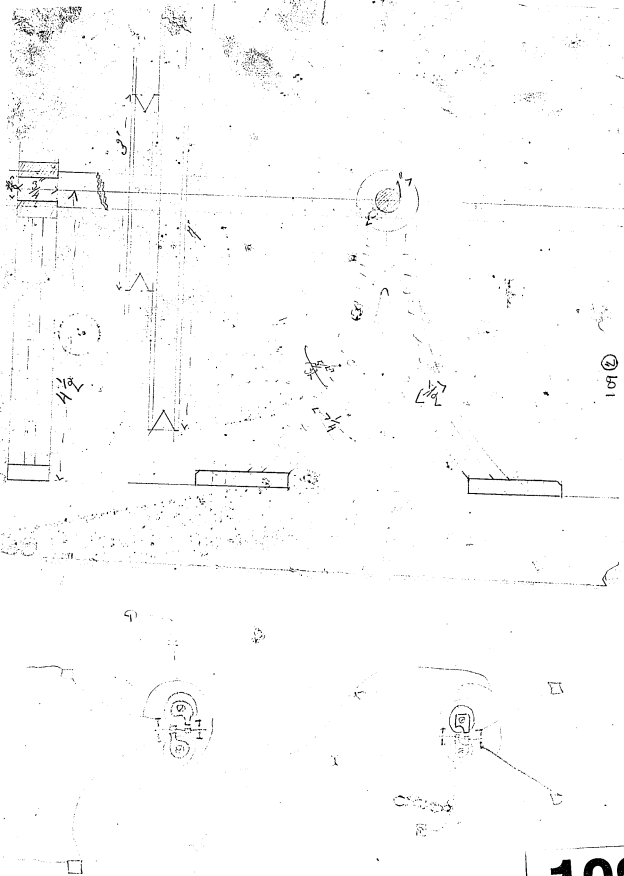


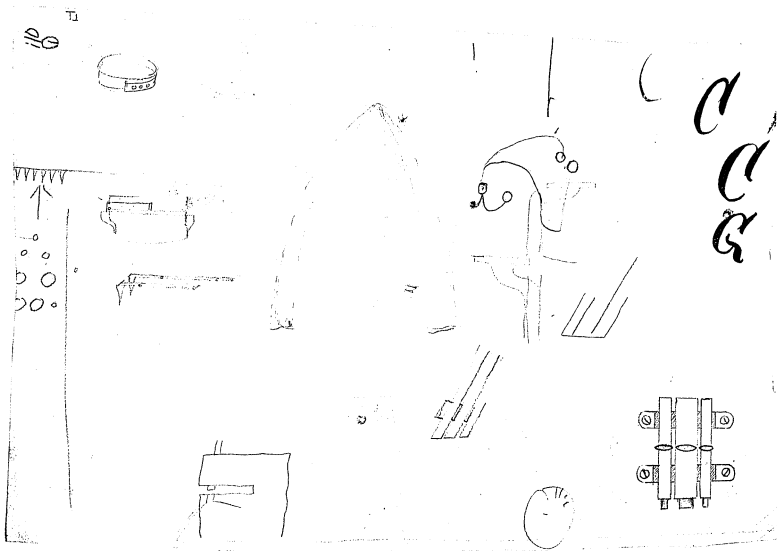
108

109

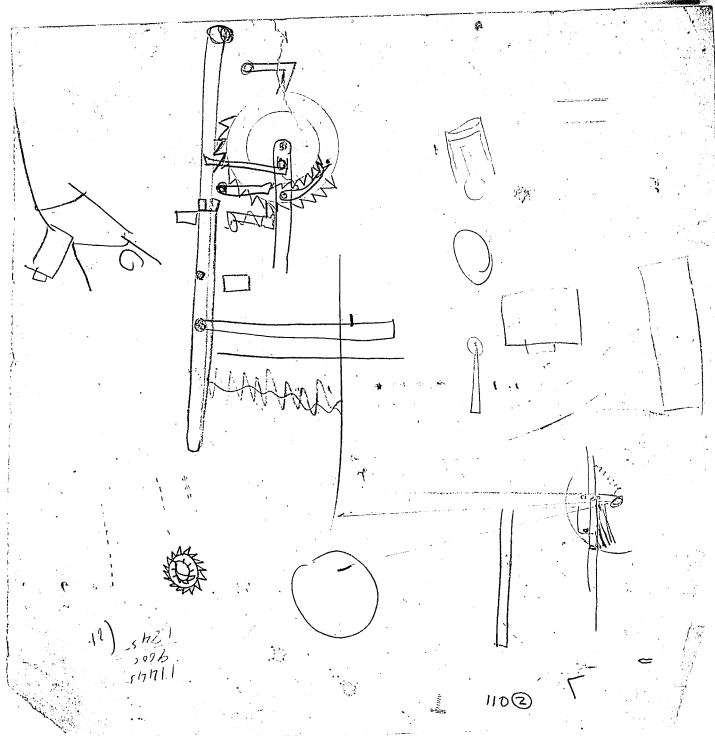
109

109

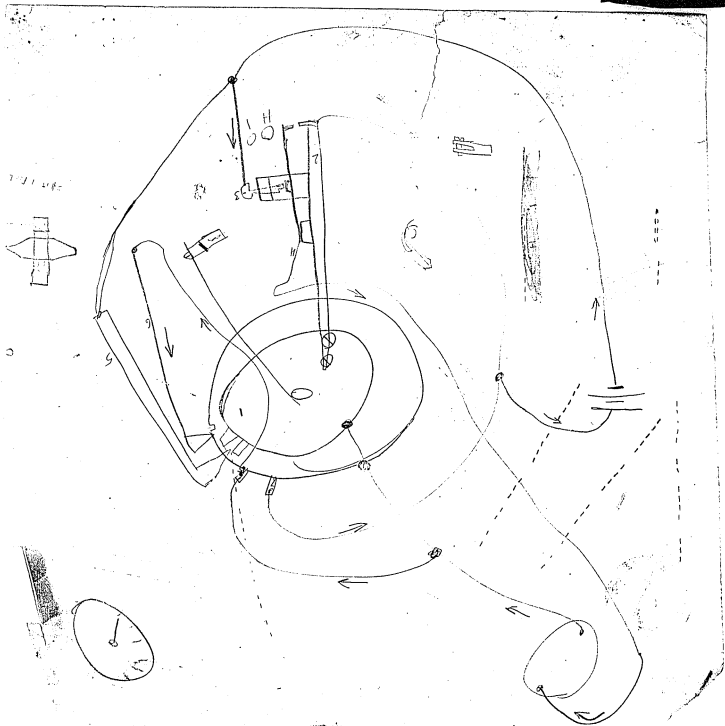




110

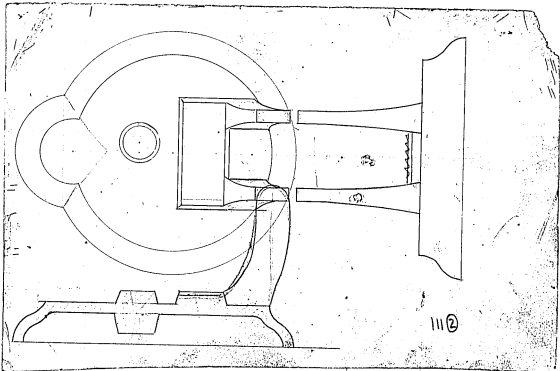
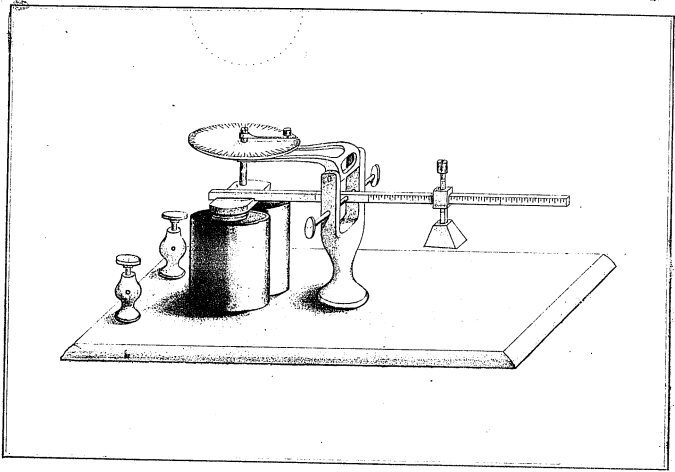


110



110

111

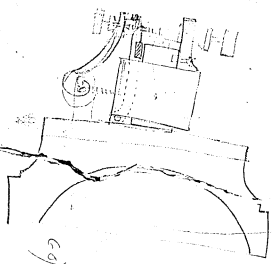
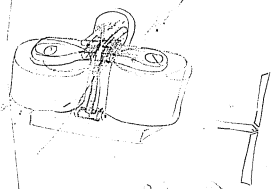
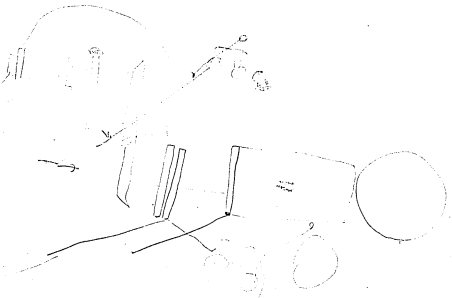
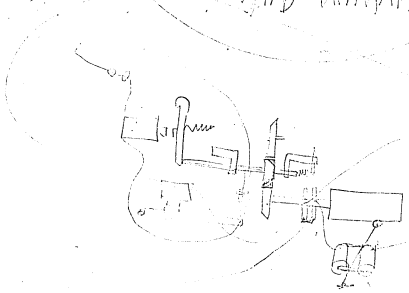


111

111②

112  
0

Machine Diagram



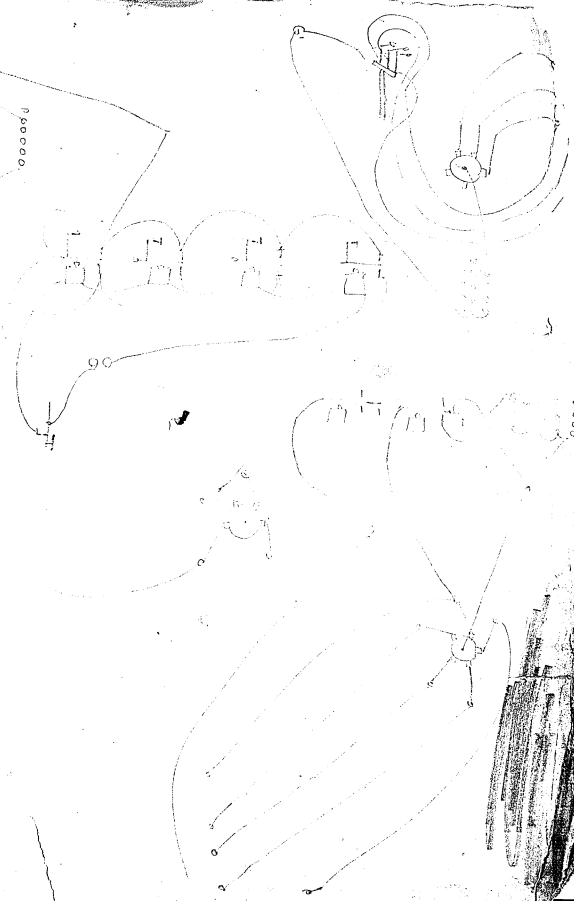
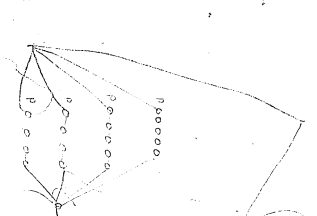
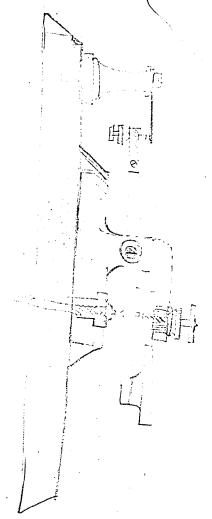
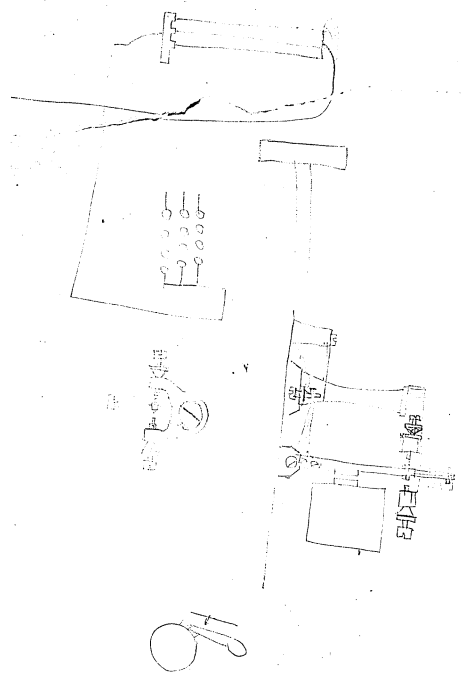
cg/1212/2



120

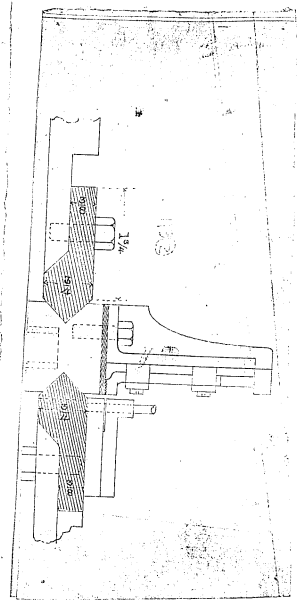
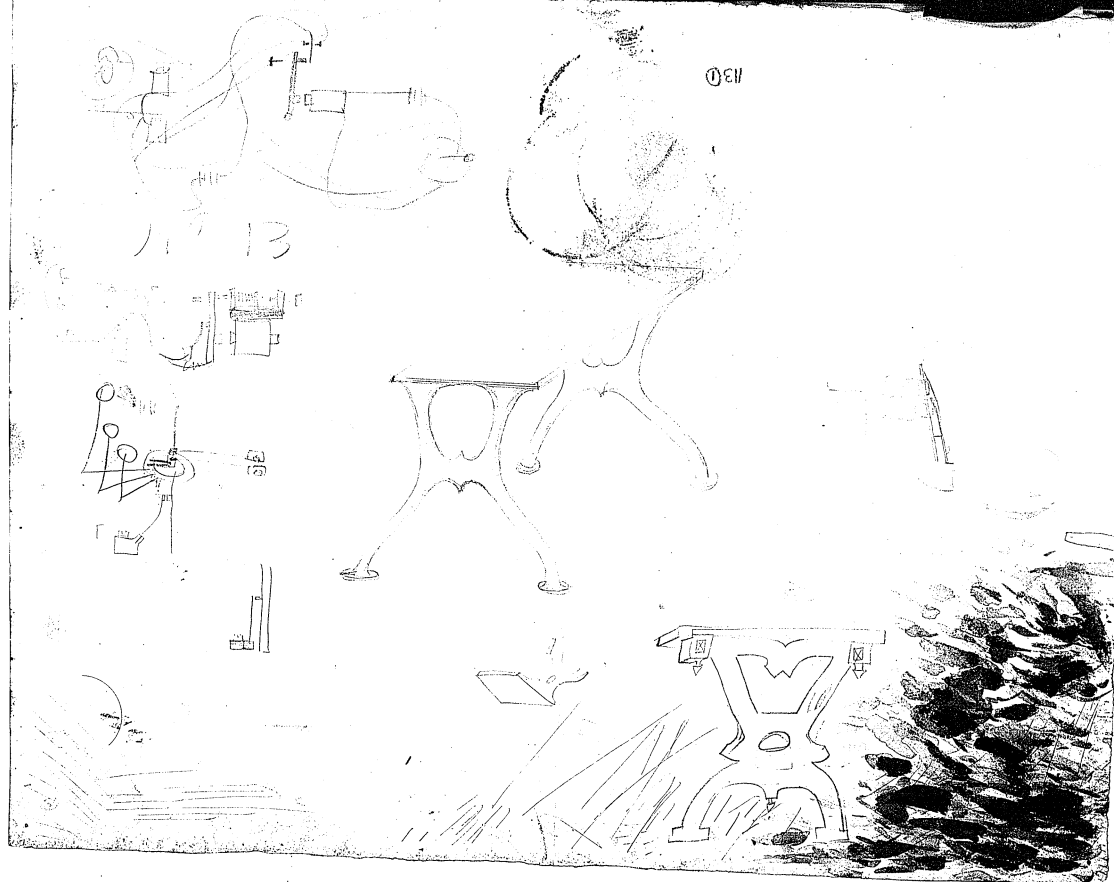
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717.8
120
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14528

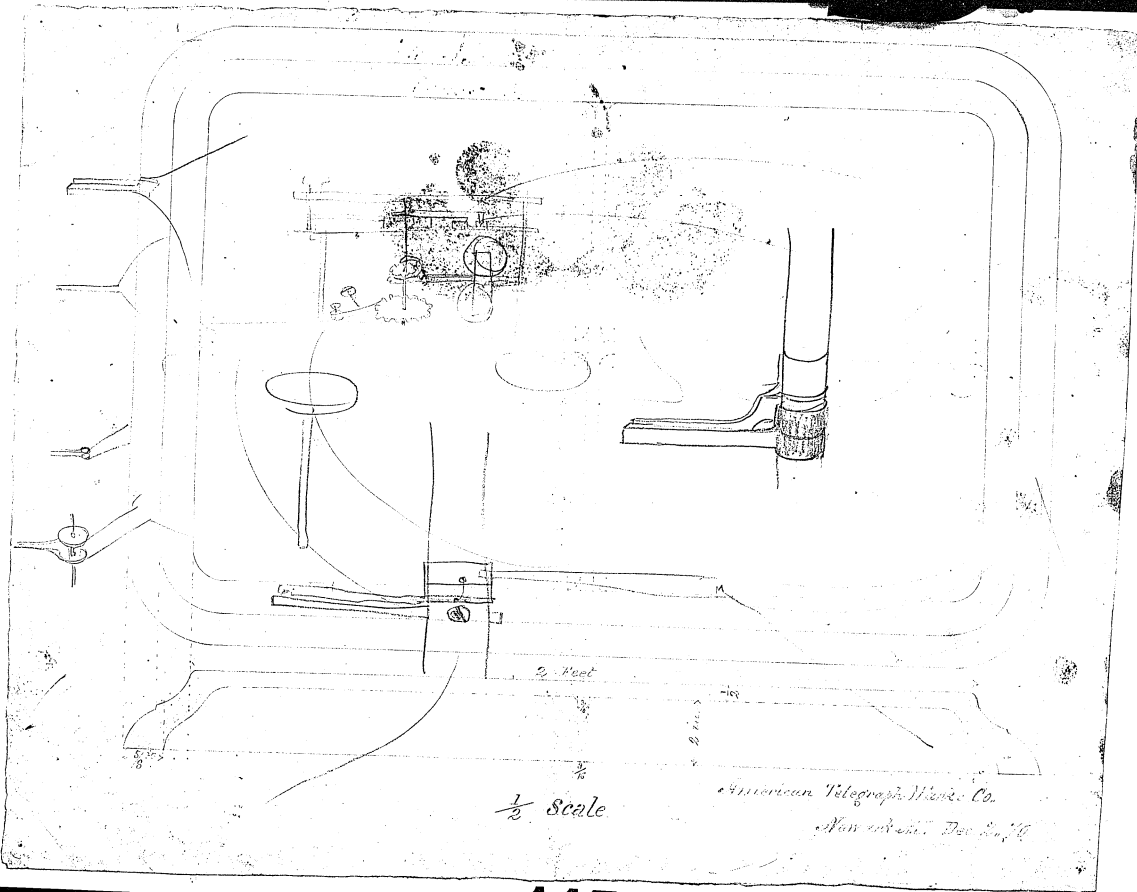
112



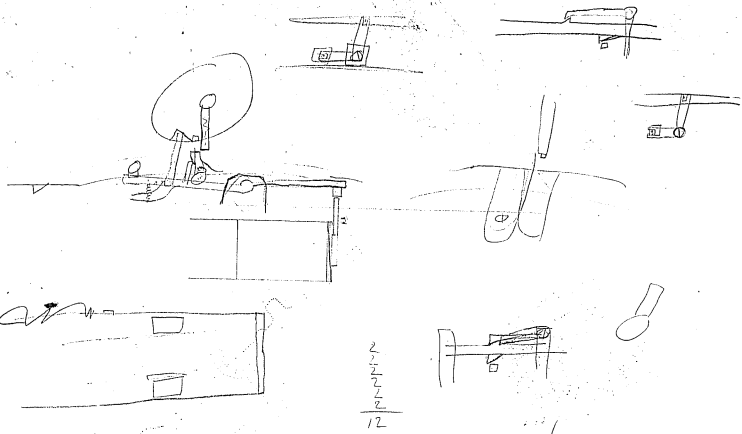
112



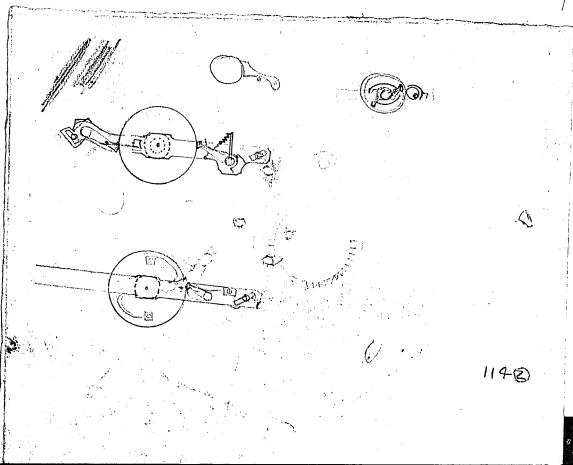




114

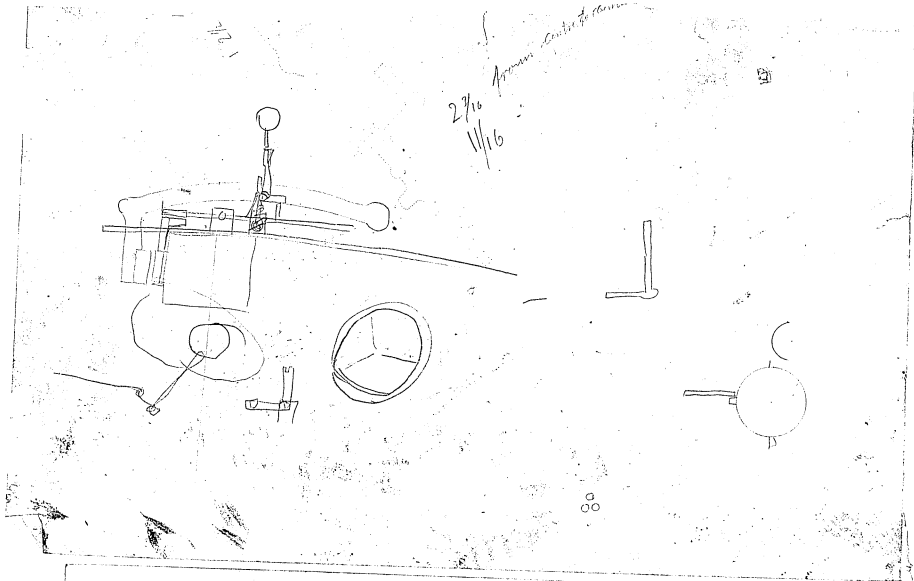


2  
2  
2  
2  
2  
12



114

114-2



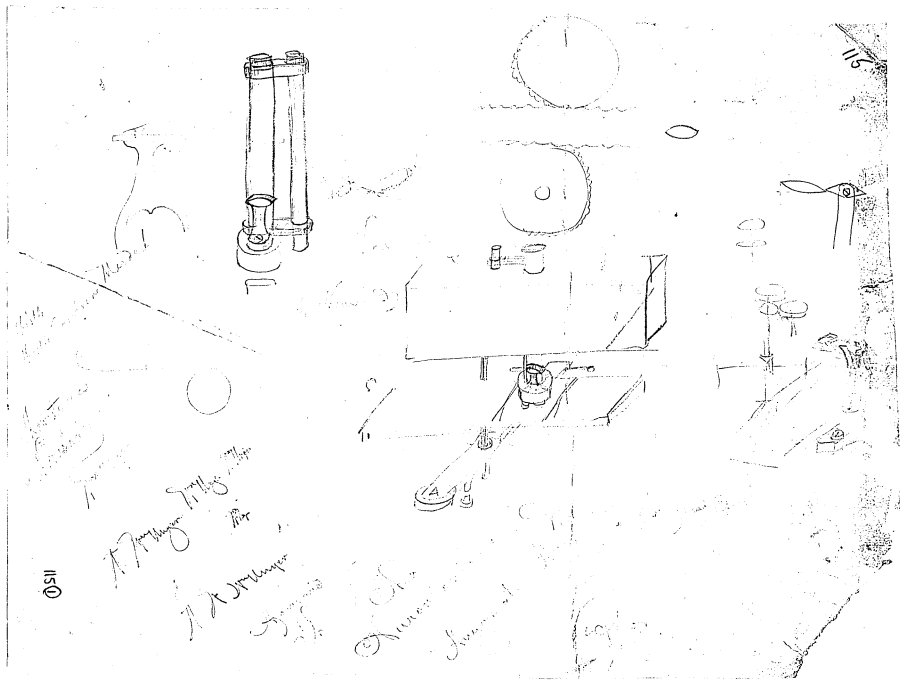
N J, C 2 -

Caulon	2	Rd4	2	st.P.	3
W U	2	LS	1	DR	2
Ma	3	2116	2		
PAA	2	049	2		
MHC	3	NW	1		
Hud	2	PIP	3		
Am	3				

o a b c d e f g h i j k l m n o p q r s t u v w x y z . #

W R A U N Y R B C 90°

114

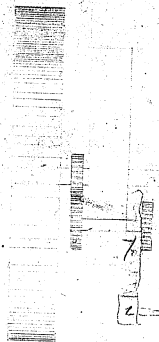


115

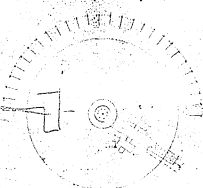
The drawing shows a complex mechanical assembly. At the top, there is a battery symbol with 'N' on the left and 'P' on the right. Below it, a horizontal line with a vertical tick mark is labeled 'Y'. To the right of this line is a vertical line with a horizontal tick mark labeled 'T'. A large, irregular loop surrounds these elements. Inside this loop, there is a smaller circular component with internal details. A vertical line extends upwards from the top of the loop. The entire drawing is rendered in a simple line-art style.

**115**

116



2



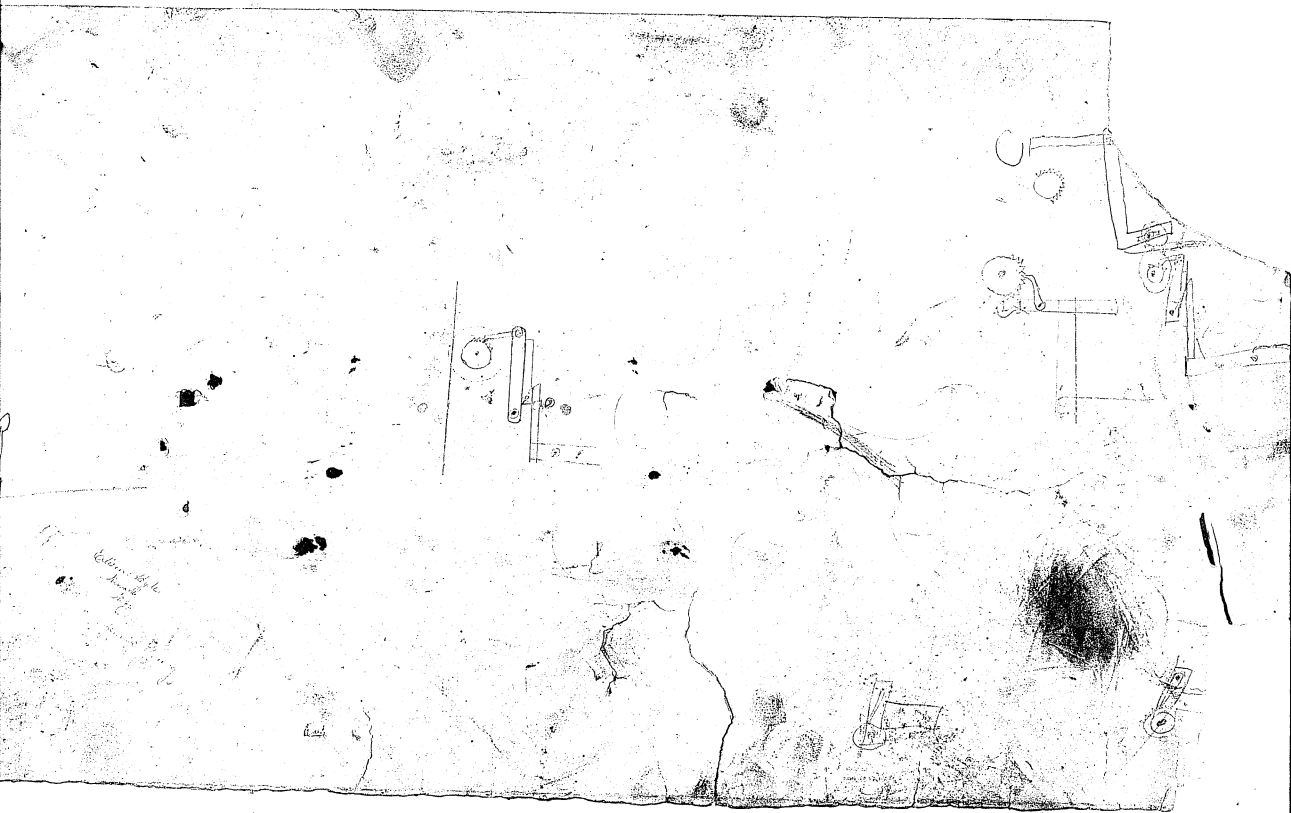
6.3

65 1/2

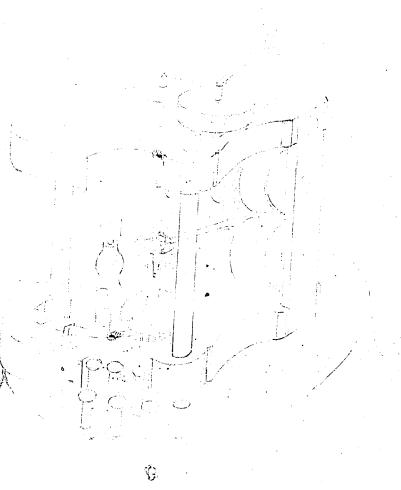


117



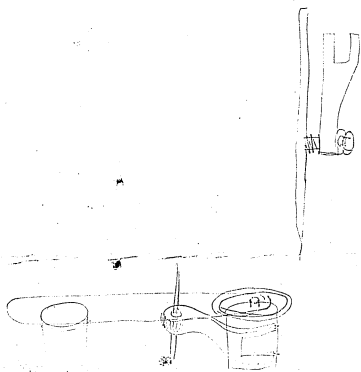


117



**118**

*Compliments of*



**118**



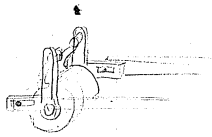
1990

X

2 Preforating Machine

Jan 1871	work To Date	30 <sup>th</sup>	Days
	5 lbs Bmp	190	
	Stuff Gal wire	200	
	11 Cast Iron	66	
	1 Finish Bar	75	
	Screws	50	
	1 3/4 lb Brass Casting	67	
	2 " Steel	66	
	OH	714	10 Hours
	Hildenbram	10	"
	"	14	"
	OH Case	2	"
	Hildenbram	17	"
	Hildenbram	7	"
	Hildenbram	13	"
	Hildenbram	1	"
	Hildenbram	8	"
	"	11	"
	Hildenbram	13	"
	Hildenbram	14	"
	Hildenbram	10	"
	"	7	"
		143	
		3008	
		443	
		324	
		886	
		1329	
		221	
		14397	
		714	
		15101	

Here follows a list of items owned  
 John W. Adams near ...  
 on the ... of ...  
 please drawing on this ...



American Telegraph works

Jan 23	work on Reperator	176	11
"	Spring wire		30
"	Rubber Magnet Heads	3	25
Feb 1	Rubber 1/4 in		30
" 1	Base Pattern	5	00
" 2	Transmitter for testing	5	00
" 2	Adjusting foot Printer	8	50
" 3	Small automatic Mch	25	39
"	Adjusting Printers	39	00
"	work on Large Reperator	159	95
		422	80

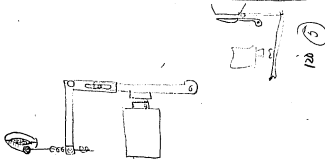
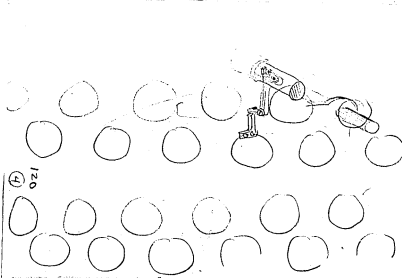
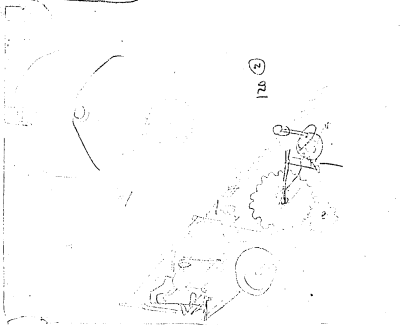
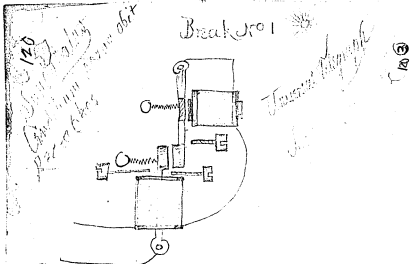
Billed

6	Adjusting Printer		50
6	1 letter wheel	16	00
7	Pattern for Union Post		75
"	1 Stick Hand Rubber	1	75
"	Repairing automatic letter		75
8	King type wheel		25
"	32 Shell Calicks		50
9	3/4 Iron wire	12	28
10	Face Mill and fixtures	50	00
11	Adjusting 3 Printers	21	25
11	Fitting Exchiments for Universal Printer	12	00

Charged

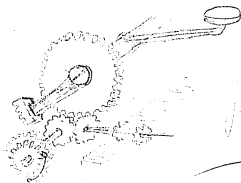
		117	03
		12	00
		105	03

13	40 Shell Calicks		75
18	Spring wire		15
21	7 Holes Adjuster Small	3	50
"	"		150
23	Shau 10 Hour Synt	5	00
23	Days 9	4	00
24	" 8 1/2	4	75
"	Shau 10	5	00
25	" 10 Darn 10	10	00



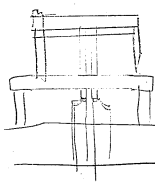
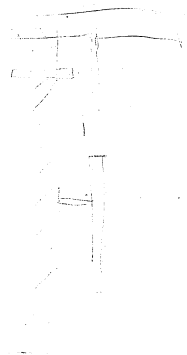
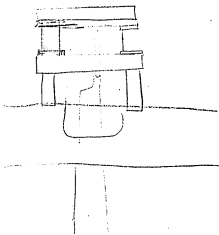
altering automatic Transmittor  
for Bell & Stock

3	Ott	10	Hours	5.00
4	"	4	" night	2.00
4	"	10	"	5.00
6	"	10	"	5.00
7	"	10	"	5.00
8	"	14	"	7.00
"	Schrauer	3		1.50
9	"	8		4.00
4	Ott	14		7.00
10	"	14		7.00
11	"	9		4.50
13	"	4 1/2		2.50
14	Schrauer	3		1.50
15	"	14		7.00
16	"	14		7.00
17	"	14		7.00
18	"	14		7.00
20	"	5		2.50
21	"	13		6.50
22	"	13		6.50
		5		2.50
				103.00
Gross				2.00
Engineering				2.40
				107.70
24	Schrauer	10 hours		5.00
				112.70



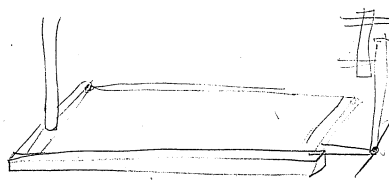
*Printed*

121



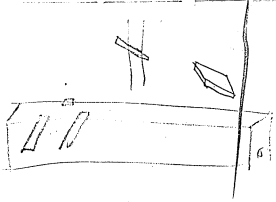
121

121



121

121

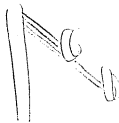


121

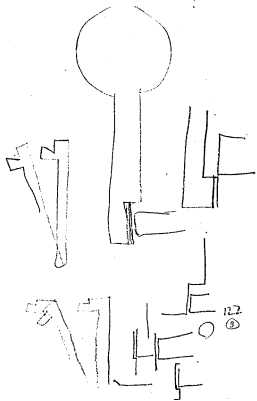
121

121

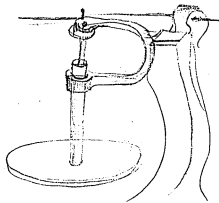




121

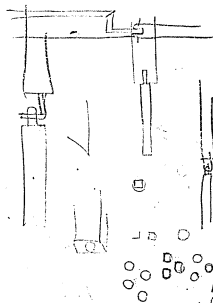
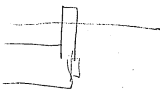
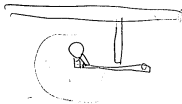
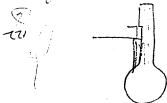


122  
②

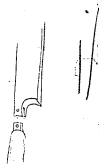


122  
②

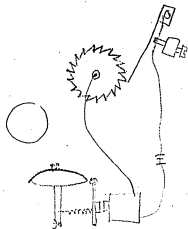
*d m scott*



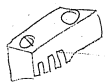
122  
④



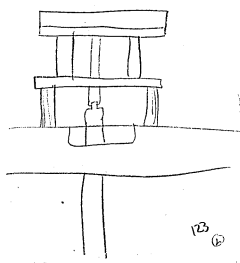
122  
④



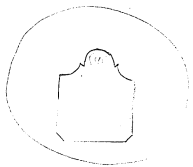
Hand on 2



120



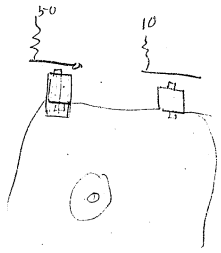
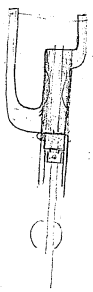
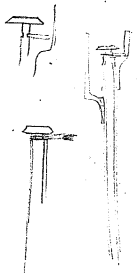
121



122

123

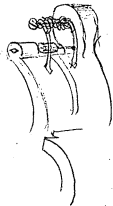
123



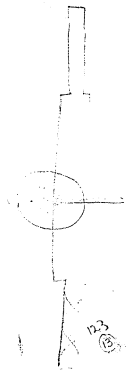
124

123

123



123



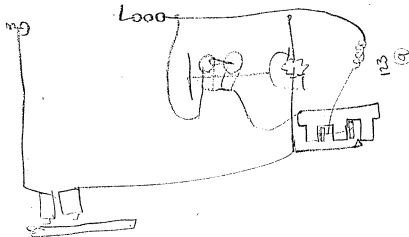
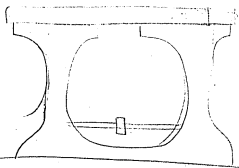
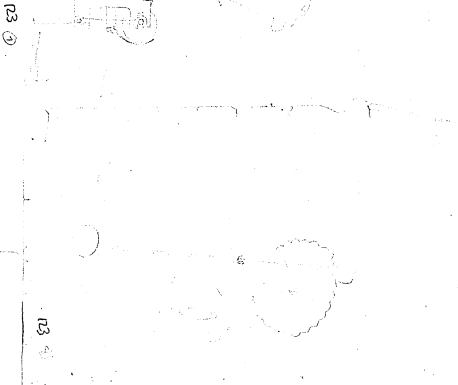
123 (9)

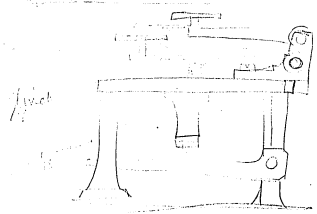
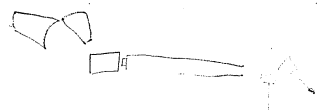
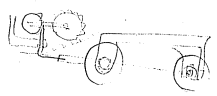
123 (9)

123 (10)

123 (8)

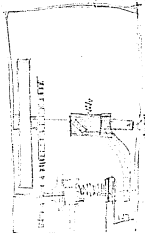
123 (12)





Project

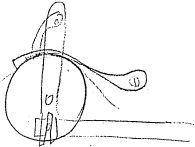
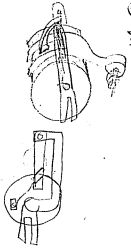
123



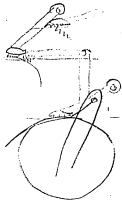
124 ⑤



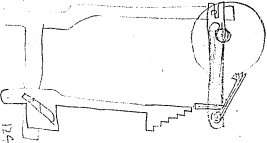
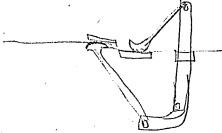
3-471



124 ④

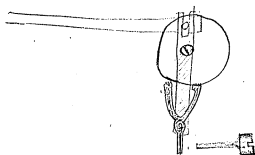
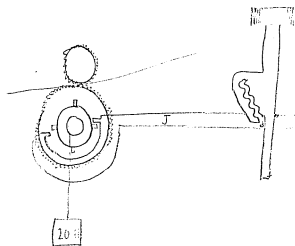
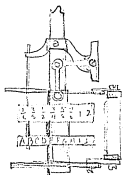
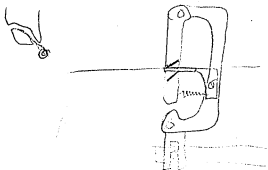


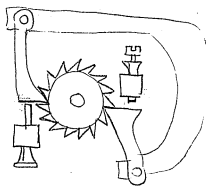
124 ③



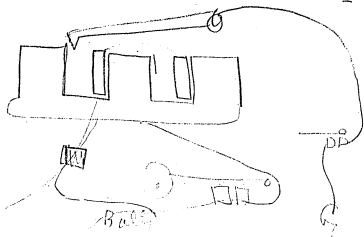
124 ②







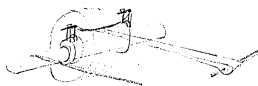
124 ⑥



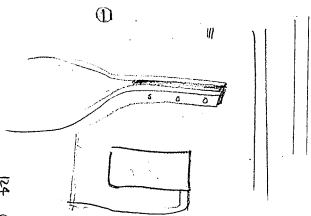
124



124 ⑤



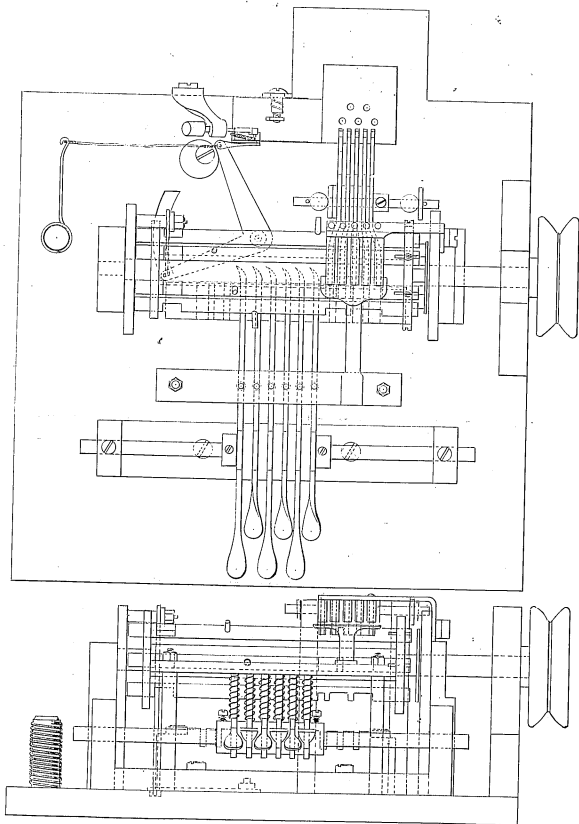
124 ②

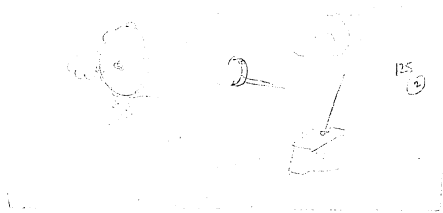


124 ⑦

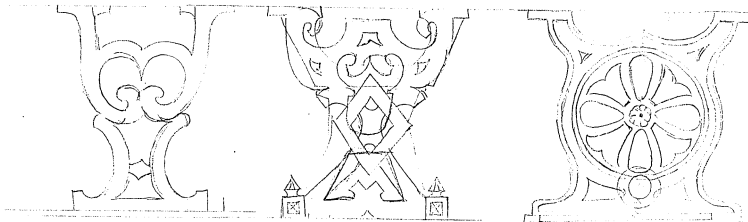
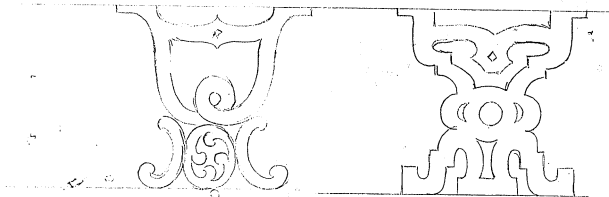
124

## PERFORATING MACHINE for TELEGRAPHS





**125**



126

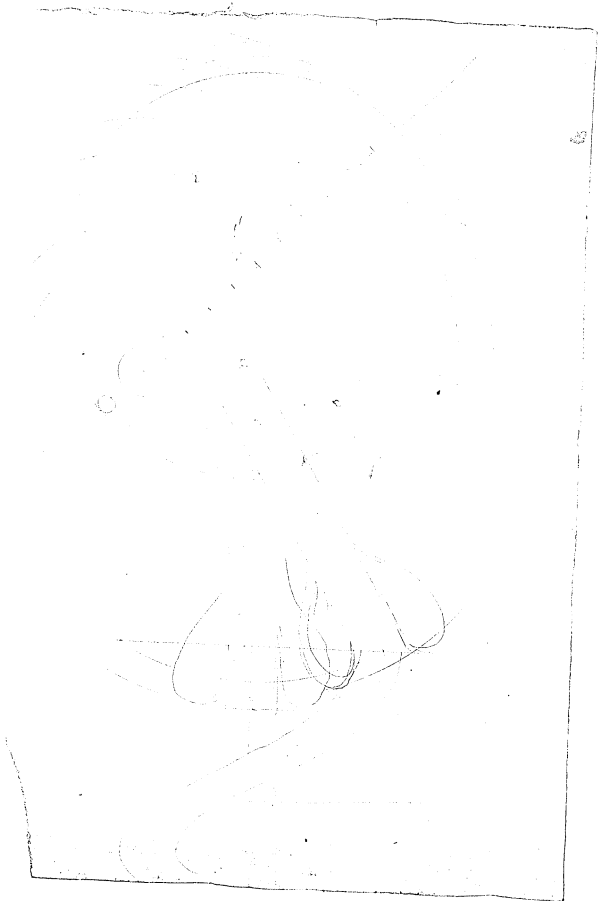
4

126 ③

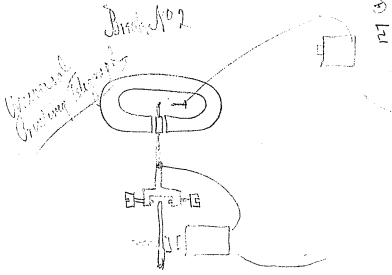


126

126 ③



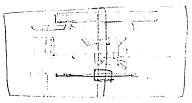
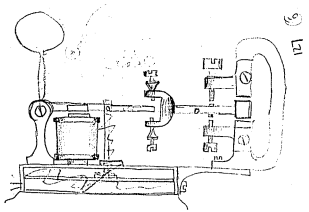
**126**



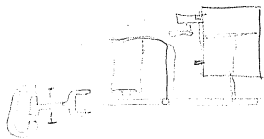
pinch had been used and for a  
 such a combination and  
 two or more, these will be  
 pinches and some of  
 them will be used a  
 one. How they are  
 used will depend upon  
 the nature of the  
 application and the  
 nature of the work.

0000 0000  
 0000 0000

> ~~General Drawing~~  
 be operated  
 in a similar manner  
 as the pinches  
 for some to act on a  
 pinches and some of  
 the pinches are used a



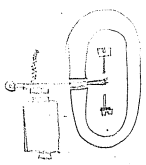
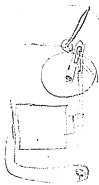
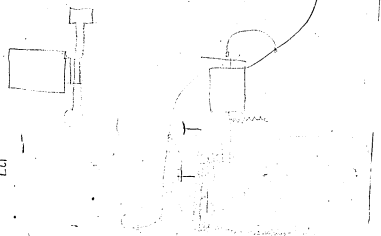
127 6



①  
Lat

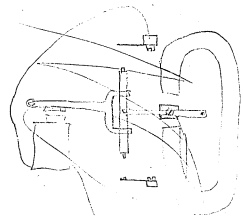


9/20

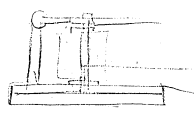


127

127



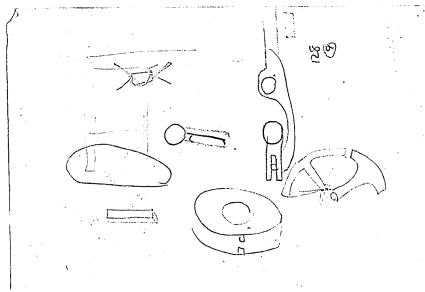
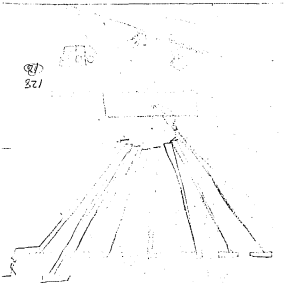
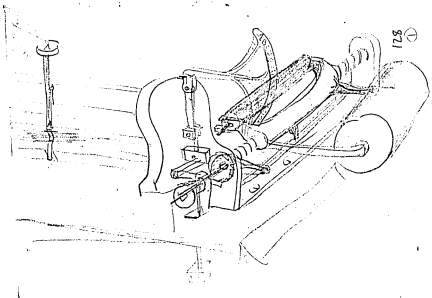
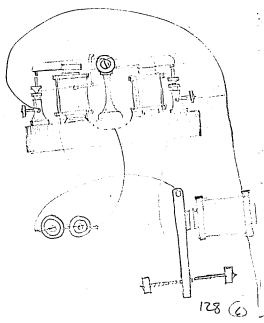
127 ⑤



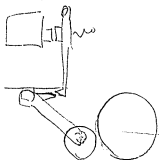
127 ②

127

120  
Breaker's Universal Printer



128

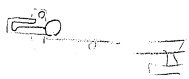
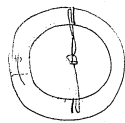
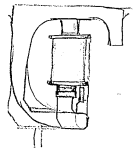


128

128  
14)

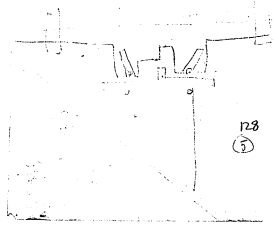
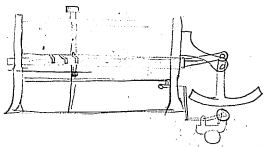


128  
2)



Handwritten text, possibly a note or description, in a cursive script. The text is difficult to read but appears to be a few lines of notes.

128  
18)

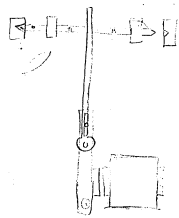


128  
5)

128  
2)

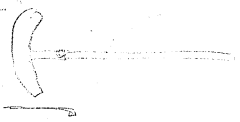
128

Print 103. Universal Printer

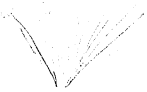


129

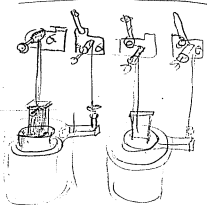
(12)



129

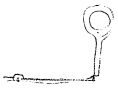


129



129

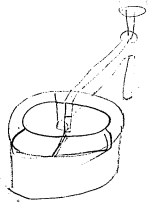
(13)



129

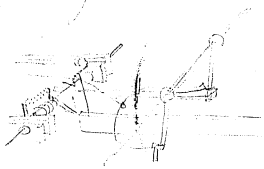
(13)

129



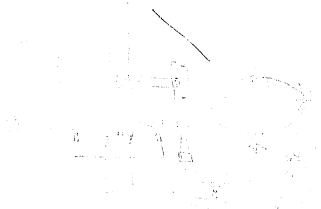
129

no  
good



129 ⑥

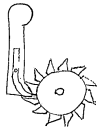
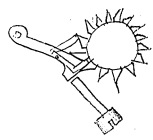
129 ⑨



129 ⑤

129

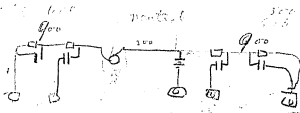
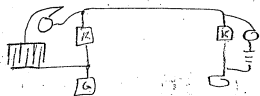
**129**



129 ⑦

129 ⑧

Experiments  
193.



Try this but by damn education  
didn't receive right & could not  
get it in metric. So that's typical, regular.

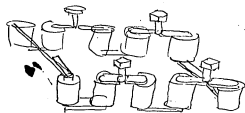
130  
①

130  
②



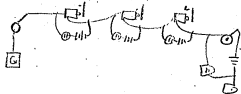
ON A CIRCUIT OF THREE LAMPS.

130  
③



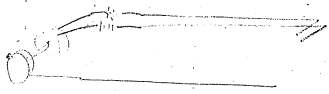
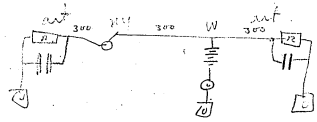
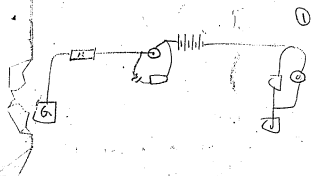
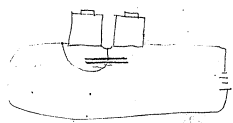
130





(10)

See if Relay shunted with wires  
 are no leading shunt low so that  
 wires stick then put local  
 opposing batteries in and see  
 if sticking is prevented and at  
 same time see if these opposing  
 battery dont push the discharge  
 current out on the line and  
 be taking:



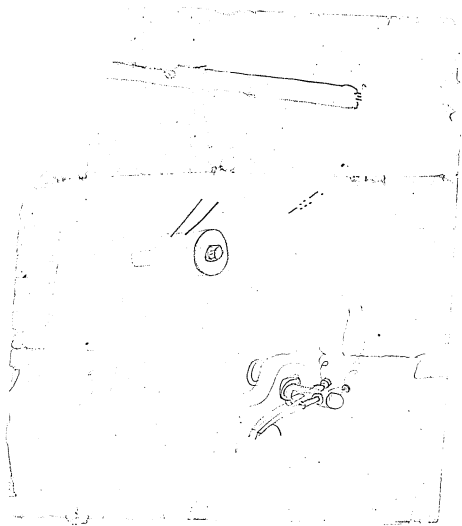
131 (2)

It may be that 600 necessary at  
 W but guess 100 do as battery  
 very strong + C chgd high  
 a thrown on long line when  
 battery off so that it will  
 take long time discharge

131

parallel

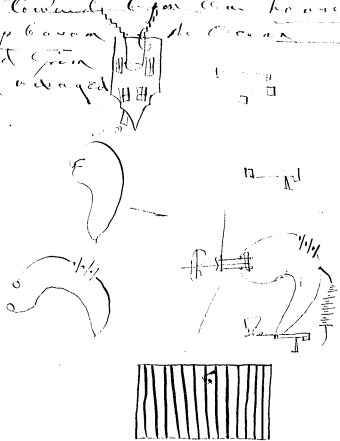




**131**



Now in the winter of our discontent  
 Made glorious summer by this  
 son of york and; all the clouds  
 that lowered upon our house we  
 in deep bosom  
 buried from  
 green winged

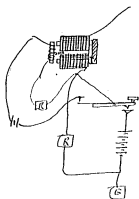
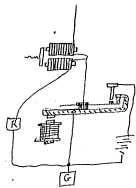


B3  
 3

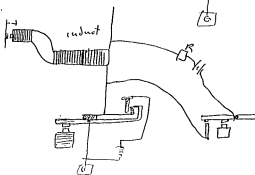
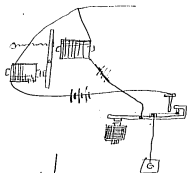
Cason

—  
□  
□  
□  
□

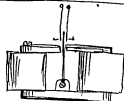
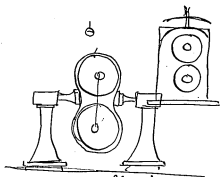
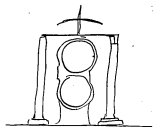
Cason Pratt <sup>Chapman Pratt</sup> fine (fine) in ...  
 Brigham Young <sup>Charles G. Bennett</sup> ...  
 Brigham Young <sup>John Taylor</sup> ...  
 Thomas Brown ...  
 Brown Brown ...



133 (5)



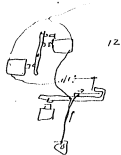
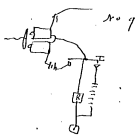
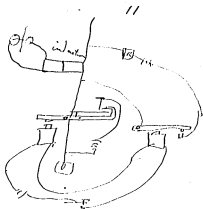
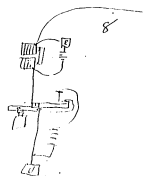
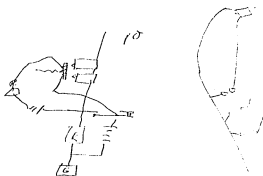
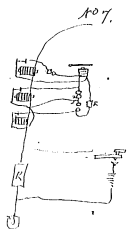
133



133

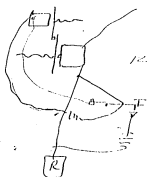
133 (1)

①  
47



134

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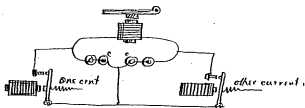


134

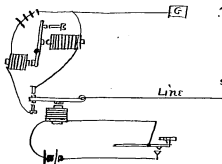
Message No. \_\_\_\_\_ The Western Union Telegraph Company, Letter

From \_\_\_\_\_ to \_\_\_\_\_ Sheet

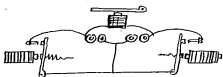
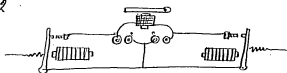
No 20.



No 21.



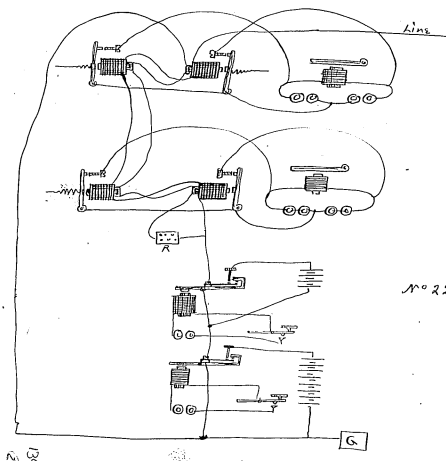
No 22



134

3





134

Range No.

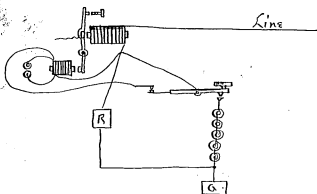
The Western Union Telegraph Company, Letter

From

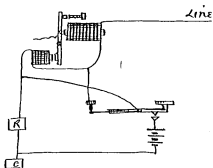
to

Sheet

No 18.

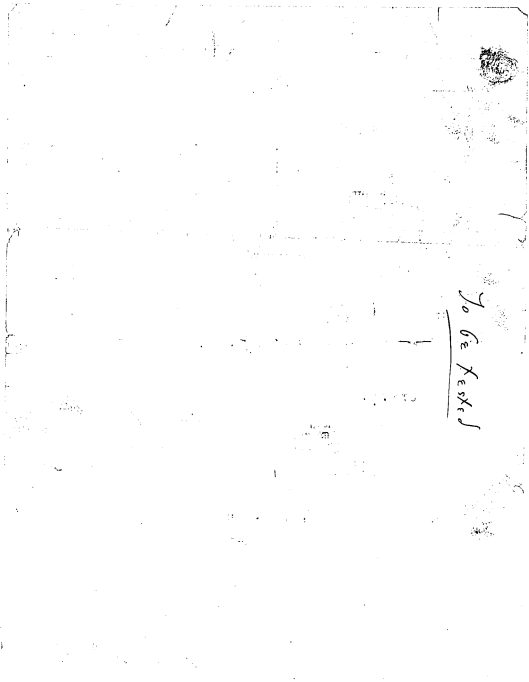


No 19.



135①

135



**135**

York

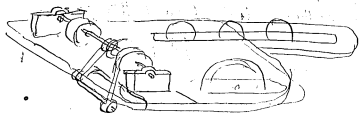
Edison

Would it be possible to use  
enough of the Sulphate Copper battery to do  
our work I presume they can insist on this  
as they use nothing else - You better come  
over

J. C. Reiff

187

Required for the use of the AMERICAN TELEGRAPH WORKS:



Approved,

Superintendent.

Foreman.

137 (1)

137

Vol. 1

1 Send to Clark Maxwell description of prevention of the diffusion of liquids by electrolytic action.

2 ~~X~~ Try the diffusion of different substances between two platinum disks.



~~Try this in  
Hydrogen.~~

Molasses. - Chromic Acid.

" Chrome Yellow.

" Russian Blue.

Alcohol colored by Saffron and deep yellow safford solution of Sulphate of  
Sulphate of copper and colored by  
Cochineal,

Potential Iron and Cal. of  
Water and Lamp black.

Glycerine & Turpentine,

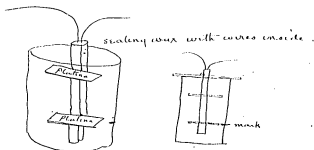
Reverse connections of battery.

In ascertaining the diffusion first place

1370

The solutions in glasses of the same character so that the platinum disks shall fit each one allow them to stand in a quiet place for 24 hours and note the rate of diffusion. Of course the lightest liquid which may be tested with the hydrometer is placed in the glass first and the liquid of a greater weight is poured down a glass tube to the bottom of the glass very slowly and carefully to prevent mechanical diffusion. a mark is then made where the two liquids join and a note made as to the sharpness of the line the glass is then covered with a piece of writing paper on which has been spread beeswax and placed over the mouth of the glass and pressed down on the rim. The evaporation at the end of 24 hours is removed which shows considerable diffusion is removed and the platinum disk placed in it so that the lower disk shall just come to the mark previously made on the glass. This is connected to the battery the lower to the zinc pole and the

copper platina pole or disk to the copper pole,  
 put aside and note the time it takes to bring back  
 the two liquids to their original position and so  
 on. With the whole number note all phenomenon -  
 The platina disks should be made thus



also immerse in *lavo* de *capilates*, and connect  
 to battery -

X  
 Arrange a test tube with two platinum strips  
 and connect 4 Callaud. and test all the metals  
 in Table A. Bloxam. under electric influence  
 and ascertain if the reactions are the same. <sup>137</sup>  
 also use very dilute solutions of the metals <sup>(4)</sup>



to be detected and see if the presence of the electric current increases or decreases the delicacy also. pass a spark constantly into the solution from the 'plate glass machine',

Evaporate different metals solutions on clean zinc (polished) by heat and note any specific colors for different metals.

A new reagent for Ammonia is described in Crookes. p. 29.

Crookes says that magnesium has the most powerful electromf of all metals. substitute it for zinc in a small cell. get deflections. p 27.

When Magnesium is put in water it liberates pure odorless hydrogen - hence associate a magnesium pen with the iron pen in reg fd solution. first before the pen in the same path 2nd after the iron pen and note the difference.

A new reagent for Calcium. Common Linglate.  
of Sodium. Crookes p 38.

The sulphide of Ammonia throws down a  
black precip with Urinum oxides & protoxide  
hence a Urinum decomposing per. would form  
protoxide which in the presence of Sulphur of  
Amon would give black signals, probably  
the ferrids & ferros would give a colored precip.  
perhaps more stable than the Sulphide of  
Urinum which like all other sulphides would  
in the air bust up and walk on their ear  
Some description is given of the action of  
Urinum in Crookes p 87. Says in testing  
Urinum with ferrocyanide in the presence of Oxalate  
Ammonium prevents the formation of the red  
precipitate.

137

Obtain Chem Pure Zinc by method described in  
Crookes p 61.

131/6j

A zinc pen forming a proto. use ammonia  
and ferri or ferro. perhaps chl sod. The persap  
is insoluble in ammonia and is probably  
white. Were a paper colored black by some  
organic color used these marks would be  
quite plain further information see Crooks  
p. 62.

Get some Chromium metal from Beardslee 11:  
Nickel plate

Barium pen. form proto, add chl sod. makes  
it chl Barium add sul a. forms precip.

To make protoxide of — Crooks 71.

Sulphocyanide Pot — " 72

Something " 73

To color paper use ie try burnt-sugar,  
Caramel, Roasted Coffee.

Copper pen - manganese salt. Candelq Salt.

Iron pen - Sulphide Am - Copper solution p  
Cooke 118  
Protosalts are kept from oxidation by  
placing them with pieces of Camphor in  
clean paper dry. Cooke 128

Get some Hydroferrocyanic Acid

Biscay iron from Spain is the softest known  
get some for pens & magnets

Peppers Book of metals p 386 - 391.  
393 440 422 458 481

470

Nickel pen - proto precip by Ammon - light  
blue very faint -

Get Palladium

Iridium

Osmium

(37)

Ruthenium pen - Etyposulphate Sodium  
with ammonia gives good permanent color  
in the  $\frac{1}{100,000}$  part very delicate;

Try and make pens in brass settings of the  
small pieces of metals on hand. Crooke 298.

Protochloride of Uranium prevents a proto  
from becoming a per it also reduces a  
Desqui to a proto. Hence mix some with  
regular 'fd' sol to prevent the proto going  
to a per - It is made by formula Crooke  
323. 324. — Refer to 347 Crooke

Ohl Cal. Carb Sod Hydro pot percip organic  
bodies - hence in Logwood sol. replace Chl Sod  
with some Conducting that does not  
give this effect. See Crooke 348.

Crooke 349. Somthg abt Iodine & Benzol  
Try Sol. - arsenic

137

137(9)

Crookes 350. gives following test for iodine  
Water 100-grms starch 1 gramme Net  
Pot 1. gm boil 5 min add 10 drops  
Hydrochloric A.

Make some regular paper. 2 lbs to  
gallon. Also same with this test  
added. proper proportion ascertain the  
increase in delicacy and permanency

More about it p 361.

# 362. Disulphide Carbon long used in France  
as a test for iodine

Cyanogen - p. 363. good

Get Chemical Charts.

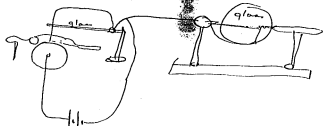
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Black paper silver pen - chl sodium -  
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Test the conductivity of continuous jump  
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E. with chemical paper. Thus



No that wont work

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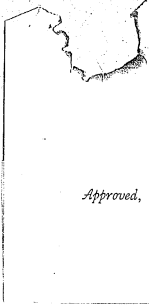
See what effect oil has poured on different  
Chemical Solutions

Quickest oxidizer. Mixture No. A. X  
Chlorate Pot. Gooke 424.

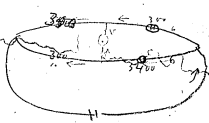
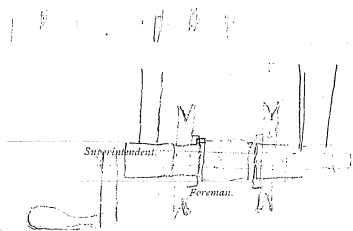
Subscribe Boston Journal Chem Chem news,  
Douglass Curran.







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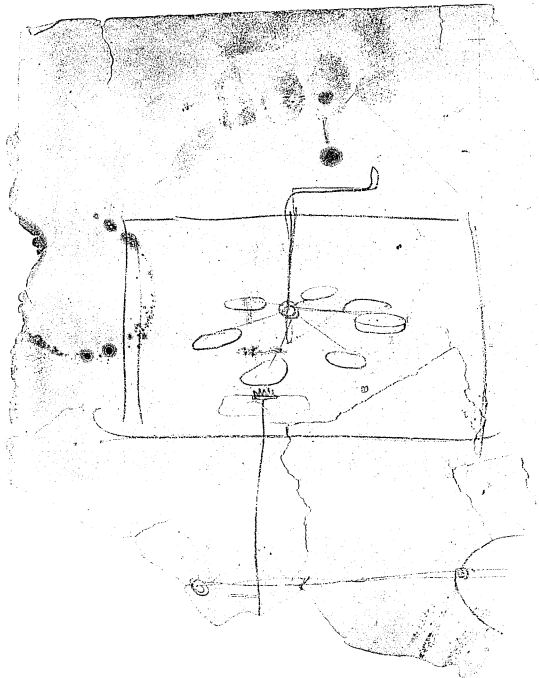
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139

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1	water	water	32	1005	17	5	1		
2	water	water	32	1025	69	70	78 1/2	34 1/2	
3	Hydro Sulph	water	32	1025	57 1/2	32 1/2	23	4 1/2	
4	and	Salt S	32	1049	56	24 1/2	11	13 1/2	
5	"	water	32	1055	55 1/2	46	35 1/2	5 1/2	
	"	chlorine	32						
6	"	water	32	1105	35	26	12 1/2	2	
7	"	Salt S	32	1115	57	52	40 1/2	7 1/2	
	"	water	32						
8	"	Salt S	32	1122	36 1/2	27	12	2	
9	"	Resin	32	1130	33 1/2	16 1/2	5	1	
10	"	Ka. S	32	1135	28	35	17 1/2	2 1/2	
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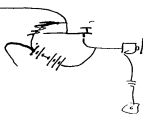
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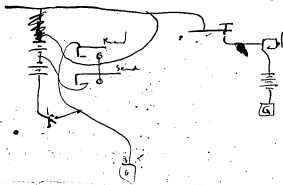
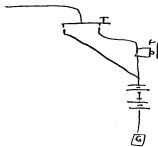
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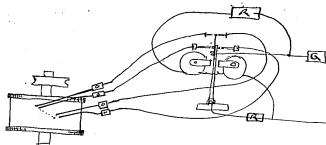


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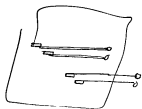
142



The Western Union Squelcher

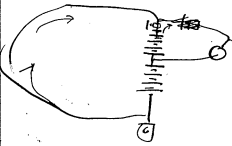
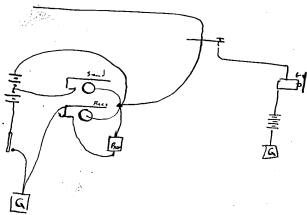
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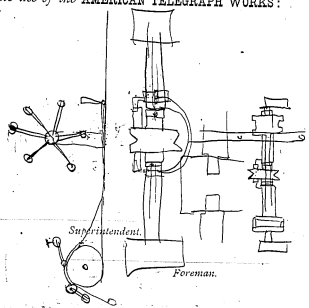
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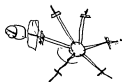
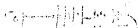


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3	"	"	367	27 1/2
4	"	"	402	5 1/2
5	"	"	416	3 1/2

AB ①

AB ①

143

No. 23,316.—CHARLES W. SMITH, of Newark, New York.—*Improved Devices for Regulating by Electricity the Issue of Gas from Burners*.—Patent dated May 18, 1858.—The claim and engravings explain the nature of this invention.

The inventor says: I wish it to be understood that I do not claim the use of the attraction and repulsion of temporary and permanent magnets, to obtain an increase or decrease of the supply of gas.

Neither do I claim the use of a jaw or ratchet, or their equivalents, for the purpose of controlling the supply of gas, and consequently the size of the flame.

But I claim the combination and use of a permanent and temporary magnet, or of two temporary magnets, one fixed and one vibrating, with a jaw and ratchet, as herein specified, as described upon the supply coil of a gas burner, or series of burners.

I claim also the use of a thin slip of metal, or its equivalent, to deflect a portion of the gas into a specified plain coil, situated entirely without the jet, as described. 1530

No. 23,325.—HENRY M. COLLIER, of Binghamton, N. Y., and HERMAN B. HAZEN, of New York, N. Y.—*Improved Electric Lamp*.—Patent dated May 18, 1858.—The claim and engravings will explain the nature of this invention. 1570

The inventors say: We do not claim the feeling together of the electrodes in an electric lamp by means of flints, springs or other mechanical appliances, nor the mechanical joint in the manner described, but only as applied to an electric lamp, or a lamp as hereinafter described.

But we claim the employment in an electric lamp of an open seat, i. e., one contained in a stationary bridge plate, or its equivalent, and receiving the electrode in such a manner as to allow the point only thereof to penetrate through it the distance required, and permitting the electric current, substantially as described.

We also claim the combination of the bonded tube carrying the upper electrode, c, the open seat, b, and the mercury tube, f, in which the tube is secured to the lower electrode, e', substantially as described. We also claim the open tube, b, which the upper electrode, d, passes through to the open seat, a, as far as it is rolled, the lower electrode, e', is also led up to the open seat, a, as far as it is rolled, the lower electrode, e', is also led up to the upper electrode, c. 1555

No. 23,353.—JACOB S. SCHWIMMER, of Glensboro, N. J.—*Improvement in the Method of Applying Electricity during Extraction of Teeth*.—Patent dated October 19, 1858.—The claim and engraving explain the nature of this invention. 1536

Claim.—Applying electricity to the gums or teeth, or both, during the operation of extracting teeth, by means of the insulated adjustable spring clip described, so as to secure the lower electrode, c, to one of the poles of an adjustable electro-magnetic machine, or its equivalent, as set forth, and for the purpose specified.

No. 23,320.—JESOME B. FAY, of Philadelphia, Pa., assignor to WILLIAM HARVEY, Jr., of said Philadelphia, assignor to JESOME B. FAY, assignor to JOHN B. COAKLEY, of said Philadelphia.—*Improvement in the Method of Extracting Teeth*.—Patent dated May 25, 1858.—This improvement consists in combining with a common dental forceps an electro-magnetic machine in such a manner that wire D from the negative pole of the machine shall form a metallic connection with that part of the forceps D that grasps the tooth, and that the positive pole of the machine shall be connected with the patient's hand by a metallic rod. 1537

Claim.—The combination of the electro-magnetic machine, or its equivalent, with the forceps, for removing teeth, in such a manner, arranged and operating substantially as by the manner described.

No. 22,063.—JAMES J. CLARK, of Philadelphia, Pa.—*Improvement in the Mode of Connecting Electro-Magnetic Apparatus with Tooth Forceps*.—Patent dated November 16, 1858.—This invention consists in the introduction of a foot key in the introduction of the circuit, so that the dentist can have the circuit open or incomplete until the proper moment, and then with his feet close it thus preserving the free use of his hands. 1538

Claim.—The employment of the foot key K or its equivalent, in combination with the electro-magnetic machine and forceps, arranged and operating substantially as described.

No. 19,718.—J. BURESS HITE, of New York, N. Y.—*Improvements in Composition for Coating Telegraph Wires*.—Patent dated March 20, 1858.—The claim will explain the nature of the composition. 1539

The inventor says: I do not wish to be understood as confining myself to the precise proportions of the first formula.

But I claim as insulating compositions for telegraphic wire, formed by mixing boiled linseed, oil seed, or rosin oil, with natural or artificial asphaltum, substantially in the manner as described.

No. 23,125.—CARTER KINGS, of Brooklyn, New York.—*Improved Method of Neutralizing Lines Attraction of the Needle*.—Patent dated November 23, 1858.—The nature of this invention consists in the arrangement of one or more magnets in a horizontal position, below or above the needle of the compass whose opposite poles lie in the horizontal plane, leaving their opposite central ends in the needle's axis of rotation, and on opposite sides thereof, by which arrangement the opposite poles of the magnet, or magnets, are caused to set upon the needle to force it into the line of its attraction, and in so applying the one or more magnets, or magnets, as to make it, or them, to revolve on a centre coinciding as nearly as practicable with the vertical axis about which the needle turns, so that its poles may be made to point in any direction necessary to compensate for the local attraction, or they may have their direction varied to impart any variation in the point, or points, of local attraction that may be produced, or different magnets, or by other means. 1530

Claim.—Applying and arranging the magnet, or magnets, in a horizontal position, or positions, so as to have the needle of the compass, with opposite poles in the vertical planes of the axis about which the needle turns, and on opposite sides thereof, and in such a manner as to be adjustable, so that its poles may be made to point in any direction about which the needle turns, so that their flexible end may be made to point in any direction necessary to compensate for local attraction and as herein set forth.

success, subjected to the action of the electric current without intervention of other machinery. 1530

No. 625.—*Improvement in Magnetic Printing Telegraph*.—This claim, first, the employment of force, derived from an electro-magnet, to govern and regulate a force derived from the use of compressed air, or other fluid, substantially in the manner and for the purpose specified.

Second, I claim an electro-magnet constructed substantially as described; that is to say, when made up of a series of hollow stationary magnets arranged substantially as specified, so as to effect the movement of a rod or other equivalent, which the latter act, substantially in the manner set forth.

Third, I claim a valve, substantially such as is specified, in combination with any electro-magnet to move that valve, and a piston or its equivalent, whose motions are effected by the pressure of air or steam, whose action is controlled by such a valve; the combination being substantially such as is specified.

Fourth, I claim an endless loop, acting as a reservoir of coloring matter, and arranged substantially in the manner and for the purpose specified, in combination with paper and a series of types and a printing cylinder, or as to record characters when pressure is applied.

Fifth, in combination with any electro-magnet, and a key-board and a printing apparatus at each locality, I claim a method of conveying the characters from the operator at one locality to a type-wheel at one determined and fixed point, when these are combined therewith a key corresponding, when the parts are in proper position with that determined and fixed point; the device and key being substantially such as specified.

Sixth, I claim a driving a type-wheel of a printing apparatus by means of a friction connection, substantially such as is described, between it and a prime mover, so that the motion of the former may be modified or its motion stopped without causing the motion of the latter to be stopped or modified.

Seventh, I claim combining with a wheel of a printing telegraph, which meet at times stop and at other times be in motion, a adjusting mechanism by the action of the parts thereof, and by altering its force to stop the wheel when released from any detent, which that arrest its rotation, the combination being substantially such as to effect the purpose set forth, substantially as described. 1530

Eighth, I claim causing the paper to be printed to approach the type which is to impress it by means of a friction connection with that the roller, so that the roller may remain in motion while the former is at rest, substantially in the manner set forth.

Ninth, I claim the apparatus substantially as herein set forth for governing the approach of paper to a type-wheel that at times moves and at other times stops, so that the apparatus which brings up the paper shall act for that purpose when the type-wheel ceases to revolve for a longer period than usual.

Tenth, I claim, in combination with a type-wheel of a printing telegraph, a sprung or toothed cylinder, substantially such as is specified, the latter causing the paper to progress as the purpose of printing by the type in the former may require, substantially as set forth; and this I also claim in combination with another surface substantially such as is specified, to press the paper upon each space in the manner substantially as described. 1530

ROYAL E. HOUSTON.

No. 20,851.—JOSUA LOWE, of New York, N. Y., assignor to HIMSELF and DANIEL BURGESS, of Jersey City, N. J.—*Improved Magnetic Steam Gauge*.—Patent dated July 7, 1858.—The claim and engravings explain the nature of this invention.

The inventor says: I am aware that air and mercury have heretofore been combined and used in tight isolated or separate chambers to make pressure gauges, but not in combination with a self-adjusting magnet and traversing needle. I am aware also that magnets, dial plates, and needles have been used in combination, but not in a tight, or isolated chamber separated from the steam boiler, or other means of making pressure, or for the purpose of marking or indicating either pressure within a boiler or a vacuum gauge, or other means, and I do not claim either of these except as herein specified and for the purpose named.

But I claim the construction of a polar magnet with one arm or pole larger than the other, so that the enlarged pole will float on the surface of the mercury, whether the lesser pole be immersed or not, whenever the said magnet is placed in contact with the mercury, and is fully filled with mercury, and hung on pivots in the centre, thus making a self-adjusting movable magnet, capable of being used as a floating magnet, within, in a tight chamber, substantially as described and shown.

I claim, also, the combination of a floating magnet, a magnetic needle, and a dial or index plate, &c., for forming one side of an isolated tight chamber, and with mercury and air within said chamber or their equivalents, for the purpose of making a magnetic pressure gauge, substantially as described and shown.

I claim, also, the combination of a floating magnet, a magnetic needle, and a dial or index plate, forming one side of an isolated tight chamber, and with mercury or other fluid within said chamber, for the purpose of making a magnetic vacuum gauge, substantially as described and shown. 1531

No. 656.—*Improvement in Electro-Magnetic Alarms*.—This claim, first, the mode of breaking and completing the circuit, or vice versa, that is, by the spring circuit-breaker operating to cause the vibration of the armature.

Second, So combining a hammer and bell with the self-vibrating armature that the vibrations of the latter shall produce a continual ringing of the bell under circumstances substantially as described.

Third, The combination of those parts, (viz: the circuit-breaker, hammer, bell, and self-vibrating armature), or their equivalent or equivalents, arranged as set forth, so as to cause a door or window to open, or to be so as not only to bring them automatically into action when the door or window is open, but to continue in continuous or continual ringing of the bell by the interruption of the electric current without intervention of other machinery. 1531

ADOLPHUS R. FORBES.

No. 19,379.—NATHANIEL PARKS, of Rome, New York.—*Improved Receiving Magnet*.—Patent dated February 19, 1858.—A A' A' is the electro-magnet, B B' the helices. The leg A' of the magnet fills only a part of the bore of the helix, the remaining space being left for the vibrations of the permanent magnet. In contact with the leg A' is an adjustable piece of soft iron C, the end of which is made to approach the magnet a and attract it, thus combining the repulsive and attractive forces in moving this magnet whenever the electro-magnet is charged.

The inventor says: I claim, of my improvement in receiving magnets for telegraphs, sending and closing the circuit by means of a vibrating permanent magnet enclosed within one of the helices, together with an electro-magnet, and operated upon by both poles of the electro-magnet in the manner set forth. 157 D

Third. The spindle d, with its adjustable bar N, and pulley f, & the spindle e, with its adjustable bar N, and pulley g, in combination with the adjustable pair, m, and endless chain l, the whole being arranged on the beam A, substantially in the manner and for the purposes specified.

No. 19,614.—JOSEPH LACROIX and RODOLPHE THIERS, of Lyons, France.—*Improved Apparatus for Regulating and Measuring the Intensity of Electric Currents*.—Patent dated March 16, 1858.—This apparatus is founded upon the combination of the following three well known principles:

First. When a galvanic current is made to pass through a liquid that is less conducting than the wires of the battery the intensity or quantity of electricity set in motion in a given time is inversely proportional to the resistance which it experiences passing through the liquid, and this resistance may be regulated either by increasing or diminishing the conducting powers of the liquid or by increasing or reducing the number of contact points immersed in the same.

Second. When the surfaces of the conductors immersed are of such metal as is not attacked by the liquid, platinum for instance, gases may be obtained in the free state which are evolved by decomposition of the liquid by the electric current, the quantity of gas obtained being proportional to the intensity of the current or to the quantity of electricity to which the increasing liquid has given passage.

Third. The attracting power of an electro-magnet varies, *ceteris paribus*, in the same proportion as the intensity of the current which creates the same.

*Claim*.—Combining the application of the three principles specified, so as to form an apparatus for regulating and measuring the force or intensity of the electric current produced by any battery, and applicable to telegraphing and motive purposes, substantially as set forth.

No. 19,766.—SAMUEL GARDNER, Jr., of New York, N. Y.—*Improved Method of Lighting Gas by Electricity*.—Patent dated March 30, 1858.—This invention relates to the lighting of gas as it issues from a burner by the heat generated by the passage of a current of electricity through a coil of platinum  $\theta$  wire, forming part of an electric conductor, and placed near the orifice of the burner. It also relates to the employment of a platinum coil near a burner to be heated by the flame to a sufficient degree to re-ignite the gas if the light should be extinguished.

*Claim*.—Placing a coil of platinum wire, or its equivalent, in the relative position to the jet of gas, as described, for the purpose of lighting the jet by electricity, and for the re-igniting it when blown out, under the circumstances and for the purposes set forth.

No. 21,781.—CHARLES W. SMITH, of Frank, N. Y.—*Improved Method of Lighting Street Lamps by Electricity*.—Patent dated October 12, 1858.—The nature of this invention will be understood from an examination of the claims and engravings. The inventor says: I claim, first, the combination and arrangement

covering the inner surface of the lens.

varied soap-stone and placed in heaters or covers, where it is exposed to a temperature of about three hundred degrees F. for about ten hours, until it becomes hard. On being taken from the heater the rubber C is found firmly attached to the lens. It is now placed in an engine lathe and a screw cut upon it.

*Claim*.—The iron wire supporter or hook in combination with a screw insulator made of hard India-rubber and attached to the hook or shank, in the manner described.

No. 20,698.—GIOVANNI CARRELLI, of Florence Italy.—*Improved Pantographic Telegraph*.—Patent dated June 29, 1858.—A description of this invention would require too much space to be given here. The claim and engraving will give an idea of the invention. The inventor says: I do not claim the general use of electricity for producing fac-similes upon chemically prepared paper or other material.

But I claim the mode of rapidly transmitting the fac-similes of writings, drawings, cyphers, and arbitrary signs in colored characters, upon ordinary white or chemically prepared paper, substantially as described.

I also claim the mode of receiving and transmitting different despatches at the same time and with a single wire, as described. I also claim the use of local piles, with almost always closed, for the production of the characters, in chemically prepared paper, as described.

No. 21,329.—MOSES G. PARKER, of Salem, Mass.—*Improved Method of Sending and Receiving Messages simultaneously over the same Telegraphic Wire*.—Patent dated August 31, 1858.—The object of this invention is to receive messages simultaneously over the same wire and upon one instrument, and this is accomplished by the employment of an accessory battery to each instrument, in combination with the main batteries and main magnets, and with a means of reversing the current of each of the main batteries.

*Claim*.—The employment of an accessory magnet and an accessory battery to each instrument in combination with the main batteries and main magnets, and with a means of reversing the direction of the current of each of the main batteries, in the manner substantially as set forth.

No. 19,116.—JOHN AMSTERDAM, of Boston, Mass.—*Improved Construction of Telegraphic Outlets*.—Patent dated January 19, 1858.—In the engravings A represents a cable formed with corrugations or flexures, as shown at b c. In figure 1 of the section wire or strand, while c represents an insulating covering of gutta-serena or other suitable flexible material, such covering being surrounded by, or being wound on it, a metallic covering of formed twisted stranded steel wire in the usual way. The metallic portion of the cable being practically insensible with reference to its insulating and protecting covering, the whole is forced either with corrugations or curls.

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**Claim.**—Constructing the head of a "screw" tripod in such a manner that the portion to which the instrument and plural lines are attached may be placed in any direction independently to the portion to which the tripod is joined, when the usual leveling screws & screws for the purpose of leveling the two portions of the head D and A together after adjustment, as set forth and for the purpose specified.

No. 19,022.—**JOSEF J. HAYDEN**, of Rising Sun, Indiana.—*Improved Method of Operating Telegram Keys*.—Patent dated January 5, 1858.—The nature of this invention consists in placing as many levers side by side as you desire to make letters or figures, each lever having elevated upon its upper edge the number of dots and lines, which, according to the Morse combination, constitute any given letter or figure, and placing the levers upon complete underneath a finger-board whose surface is perforated with openings through which the raised dots and lines may protrude, the surface of said finger-board being fitted so that the dots or openings may be in the centre of the groove or flute. In the front part of the lever is placed a wire staple, with the points marked with the letter A, and caused to spring back to its place upon being pressed down; by passing the finger along the flutes over the space of any desired length, thereby securing perfect mathematical accuracy in the formation of the cipher which composes the "Morse Telegraph Alphabet."

No. 19,278.—**LOUIS BRAUER**, of Washington, D. C., assignor to HISSOLD, L. O. BRANDEBURG, and JOSEPH B. STEWART, of said Washington.—*Improved Apparatus for Paying out Telegraphic Cable*.—Patent dated February 3, 1858.—This invention is designed to overcome the difficulty which has heretofore attended the laying of telegraph cable across the ocean. It provides a spring pulley frame for supporting and weighing the draught on the cable, and receiving all sudden shocks by being combined with the valves of the propelling engine and with the valves of the paying out apparatus, increasing or cutting off the supply of steam as necessarily requires, and thus controls the paying out of the cable or the speed of the steamer.

**Claim.**—I claim the arrangement of the spring pulley-frame with the paying out apparatus and the valves of both the paying out engine and propelling engine or either of the same separately, substantially as set forth for the purposes set forth.

No. 21,371.—**GEORGE SCOTT**, of Wisconsin, Me.—*Apparatus for Paying out Telegraphic Cable*.—Patent dated August 31, 1858.—The claim and engravings explain the nature of this invention. The inventor says: I claim in combination with a delivering roller, or a system of delivering rollers A B, a tilting lever G, its equivalent, and a brake mechanism, or any equivalent there-

The inventor says: I do not claim generally the use of the power of electricity or magnetism for telegraphic messages at a distance, and connecting them either in printed letters or characters, nor the general arrangement of the wires, posts, or electric circuit or circuits, as those are old and well known.

But I claim the use and application of the combined permanent and electro-magnets in the resilient magnet, substantially as set forth and described.

I claim also the arrangement of the springs  $B$  and  $C$ , or their equivalent, in connexion with the circuit breaker shaft  $G$  and typewheel shaft  $H$ , by which the circuit breaker arm  $D$  and typewheel  $I$  are caused to return to their starting point after the conclusion of one letter, thereby causing the instrument to be kept constantly self-regulated.

I claim also the use and arrangement or combination of the circuit breaker wheel  $D$  with its unlatched periphery, and the hammer  $F$  and arm  $E$ , placed and arranged substantially as described, so that the revolution of the wheel  $D$  shall alternately connect and disconnect such hammer and anvil, and also connected with the main telegraphic shaft, substantially as set forth and described.

I claim also the arrangement substantially as described of the hollow shaft  $G$  and clutch  $F$ , and arm  $E$ , and the connexion therewith, substantially as set forth and described, in which the clutch wheel  $F$  is made to take hold of such shaft  $G$  on the hollow shaft  $G$ , to carry forward such shaft  $G$ , and the circuit breaker, and the arm  $E$ , whenever any key is depressed, substantially as set forth.

I claim also the arrangement and combination of the vibrating lever  $F$  and its ripples  $g$ , with the escapement wheel  $o$ , constructed as described, to cause the vibrating shaft to vibrate alternately by every vibration of such lever, substantially as and for the purpose set forth.

I claim also the use and arrangement of the spring  $L$  with its adjusting slide and adjusting screw, substantially as set forth and described, for the purpose of regulating the action of the vibrating lever  $F$ .

I claim also the arrangement and combination of the imprinting cam  $p$ , the paper propelling eccentric  $q$ , and the typewheel retaining plate  $r$ , substantially as set forth, being attached to each other and placed upon a common shaft or otherwise, but so that it is impossible that they should get into different relative positions.

I claim also, in connexion with such imprinting cam  $p$ , paper propelling eccentric and typewheel retaining plate, the arrangement and combination of the roll  $s$ , bar  $y$ , and imprinting press  $z$ , and the roll  $u$  and the rod  $v$  together mounted on a common shaft, the rod  $v$  being to be propelled far enough for the next letter, and the detent cog-wheel  $F$  to be forced down so that the typewheel may return to its starting point, and again force up the typewheel, and, and also cause each of these several things to be done and in its proper time.

I also claim the arrangement of the armature  $B$ , constructed of  $(62\text{D})$

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the key-rod is provided with strips of ivory, the lowest strip having a notch, also which spring  $O$  falls when the key-rod has arrived at its highest position. Spring  $O$  extends from metallic rod  $L$ , which latter is at one end supported by a insulating post  $M$ , while its other end has a metallic connection  $N$  with saddle-bars  $F$ . The edge of spring  $O$  works against the side of the lower part of key-rod  $K$  and while it is in contact with one of the ivory strips, the electric current will be broken, but when in contact with the metal, it will be closed. The relative lengths of the ivory strips and the metal between them serve to produce a character indicative of a letter of the alphabet, as in other telegraphic registers.

The inventor says: We are aware that it is not new to close and break an electric circuit by means of a moving part of metal, having strips of ivory or other electro non-conducting material inserted within it, and made to operate against a metallic spring connected with one pole of an electric battery, the said moving piece of metal being connected with the other pole thereof; therefore we do not claim such to be our invention, but we do claim, in combination with a sliding-key circuit breaker of the description, a friction slide, a metallic bar  $L$ , and an insulated stop-rod  $K$ , or the equivalent thereof, the whole being made to operate together, substantially as specified.

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No. 15,259.—JOHN N. CASWELL.—Improvement in Apparatus for Discharging Accumulators. *Electricity*. *Filed* June 25, 1864.—Ante-dated August 7, 1865; patented in England, September 16, 1864. (Plates, p. 143.)

The train of wires  $D$  passing over ivory studs  $e$  forms part of the main circuit. This is composed of several pieces of inferior conductor (see instance  $l$ ) represented in strong broken lines, and of short pieces  $f$  (represented in strong full lines) of superior conductor for instance copper. The short pieces  $f$  are connected in points  $k$ ;  $l$  is the usual noise wire entering the office; the other and connects with one end of a sheet of platinum, from whose other end a fine platinum wire leads to the tongue. The points  $k$  are in close proximity (but without touching) to the points  $l$  of a series of superior conducting wires soldered to a copper trough  $E$ , to the bottom of which trough copper wires are attached which extend to the ground. On opposite sides and at short distances from the plates, where are placed two sets of copper plates  $g$ , insulated by brackets  $o$ , which carry them and the platinum plates. These copper plates are studded all over their inner faces with points  $p$  of superior conducting metal, while the sides and ends are to the platinum plates, and they are connected with the trough by copper wires  $q$ , which are of such form so as yield when the boards  $A$  are adjusted by the screws  $C$ .

The principle upon which this apparatus is constructed is, that atmospheric electricity will keep from one conductor to another, but that a galvanic current, such as used in the working of the telegraph tor.

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connection for its zinc pole also, to complete its circuit and bring it into action. But in this case, as represented in the diagram; the wire  $L$ , leading from the zinc pole of the battery  $Z$ , and being connected with the point  $B$  of the break-circuit key  $Y$ , consequently the battery  $Z$  is inactive.

The battery  $Z$  being connected to the ground-plate  $x$  by the wire  $y$ , leading from the ground-plate  $x$  to the zinc pole of the battery  $Z$ , which is connected with the break-circuit key  $Y$  by the wire  $B$ , leading from the platinum pole of the battery  $Z$  to the break-circuit key  $Y$ , the main wire  $d$  being in connexion with the break-circuit key  $Y$ , and the metal arm  $d'$  of standard  $d$  and standard  $d'$  being connected with the helices  $C'$  by the wire  $a'$ , and the helices  $C'$  being connected to the metal standard  $d'$  by the wire  $a'$ , and the standard  $d'$  being connected with the helices  $C$  by the wire  $a$ , and the helices  $C$  being connected with the metal standard  $d$  by the wire  $a$ , and the standard  $d$  being connected with the break-circuit key  $Y$  by the wire  $b$ , and the helices  $C$  being connected with the metal standard  $d$  by the wire  $b$ , and the standard  $d$  being connected with the break-circuit key  $Y$  by the wire  $b$ , having the terminals of the unbroken connexion leading from the platinum pole of the battery  $Z$ , and having to ground connexion at the point  $B$ , consequently the helices  $C$  and  $C'$  are connected to the circuit  $Z$ , being the representative of the platinum pole of the battery  $Z$ , being brought in connexion with the wire  $L$  leading to the zinc pole of the battery  $Z$ , and the platinum pole of the battery  $Z$  being connected with the ground-plate  $x$  by the wire  $y$ , the circuit is complete, having the zinc pole of the battery  $Z$  connected with the ground-plate  $x$ , and the platinum pole of the battery  $Z$  connected with the ground-plate  $x$ . The circuit  $Z$  now complete, the current passes from the zinc pole of the battery  $Z$ , which is connected with the ground-plate  $x$ , to the platinum pole of the battery  $Z$ , that is connected with the helices  $C$  and  $C'$ .

The helices  $B$  and  $C'$ , being placed near enough to the metal arm  $B$  of the vibrating armature lever, to attract the metal arm  $B$  with equal force, the armature lever is drawn from its perpendicular position ("where it rests, touching the non-conducting points  $a$  of  $a'$ ") against the metal points  $a'$  of the metal-points  $a$  being connected by the wire  $a'$  with the main circuit  $Z$ .

Ground connections are formed between the helices  $B$  and  $C'$  through the wires  $a$  and  $a'$ , leading from the metal standards  $d$  and  $d'$  to the metal points  $a'$  of the metal points  $a$ , and the helices  $B$  and  $C'$  are connected to the metal axes  $i$ , and the metal axes  $i$  in connexion with the metal standards  $d$  and  $d'$ , and the terminals of the metal standards  $d$  and  $d'$  to the wires  $L$  and  $Z$  being separated by the ground connexion, and these ground connections being at a metal standard  $d$  and  $d'$ , the circuit from the battery  $Z$ , then passes from the zinc pole that is connected with the ground-plate  $x$  to the ground-plate  $x$ , which is now the terminals of the platinum pole of the battery  $Z$ , and the platinum pole of the battery  $Z$  being connected with their respective ground connections at the ground-plates  $x$  and  $x'$ . The

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current from the battery  $Z$ , also passes from its zinc pole that is connected with the ground-plate  $x$ , which is now the terminals of the zinc pole of the battery  $Z$ , to its platinum pole that is connected with the ground-plate  $x'$ ; the battery  $Z$  also remains active, in consequence of the zinc and platinum plates having their respective connections with the ground-plate  $x$  and  $x'$ ; the helices  $B$  being in the circuit actuated by the battery  $Z$ , and the helices  $C'$  being in the circuit actuated by the battery  $Z$ . The helices  $C$  having been previously connected to the metal arm  $B$  of the armature lever, so as to require the power of both helices  $B$  and  $C'$  to draw the armature lever from its perpendicular position against the metal points  $a'$ , the power of the helices  $B$  is not sufficient in itself for such purpose without the aid of the helices  $C$ , and the power of the helices  $C'$  being insufficient for such purpose without the aid of the helices  $B$ , but the helices  $B$  and  $C'$  being connected to the metal standards  $d$  and  $d'$  against the points  $a$  and  $a'$  of the circuit of the battery  $Z$  is broken again by separating the point  $B$  of the break-circuit key  $Y$  from the wire  $L$  leading to the zinc pole of the battery  $Z$ , it destroys the attractive power of the helices  $B$ , and the helices  $C'$  not being able to retain the armature lever in its position against the points  $a'$  of  $a'$  by their power of attraction alone, the weight of the metal arm  $B$  draws it down to a point equivalent to a spring in this case, causes it to leave the metal points  $a'$  of  $a'$ , and assume its perpendicular position against the non-conducting points  $a$  of  $a$ ; thereby breaking the ground connections with the ground-plates  $x$  and  $x'$ , and thereby causing the helices  $B$  and  $C'$  to assist each other so soon as the point  $B$  comes in contact with the wire  $L$ , making the connections between the batteries  $Z$  and  $Z'$  as heretofore described.

It is a self-spring connected with the armature lever, and so adjusted as to draw back the armature lever from its perpendicular position, the force greater than the attraction of either electro-magnet, but less than the sum of their attractions.

Other.—The mode described of dividing a long line of telegraphic wires into two circuits, and transmitting signals from either section to the other, may be means of two reversing electro-magnets at an intermediate station, the helices of which are interposed in the line of main wires, one after the other; and may also be effected by means of a single armature lever, or its equivalent, which, by the motion produced by the attraction of the magnets, makes contact of a ground wire or wires with the main line between the two magnets, and so adds to the electro-magnets and armature lever being combined with a spring, or other equivalent force, adjusted so as to draw back the armature lever with a force greater than the attraction of either electro-magnet, but less than the sum of their attractions, or any combination of apparatus operating in substantially the same manner.

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17th. Claims the arrangement of the wires, the arms a and b, or their equivalents for the purpose of effecting electric communication alternately with the time magnet D, and the striking magnet H, essentially as described.

No. 20,978.—WILLIAM WHITE, of Roxbury, Mass.—*Improved Electro-Magnetic House Alarm*.—Patent dated July 20, 1858.—The claim and engraving will explain the nature of this invention. *Claim.*—The improved house alarm described, consisting of a combination of the following elements, viz: First, a series of electro-magnetic circuits B; second, an indicator or indicator driven, by means of the circuits; third, an alarm apparatus; fourth, the window or door springs—the whole operating as set forth to sound the alarm, and detect the circuit attack.

No. 19,012.—GEORGE M. PIERCE, of Troy, N. Y.—*Improvement in Electro-Magnetic Speed Governor*.—Patented January 19, 1858.—This improvement consists in causing any suitable governor or indicator, of variable motion, to regulate the speed of the machine or instrument with or by which it is to regulate the respective parts, by acting the governor or indicator control and regulate, by closing and cutting the electric circuit, the motive action of a current of electricity upon an electro-magnetic, or other electro-magnetic device arranged to work, or to regulate the action of whatever contrivance mechanism is employed to change the speed of the machine. *Claim.*—Causing a centrifugal or other suitable speed governor to regulate the motion of the machine or instrument with, or by which such governor is driven, by making the governor close and break a current of electricity, which is to regulate the motion of the contrivance, arranged to work whatever device or mechanism is employed, to change the speed of the machine or instrument, as described.

No. 20,234.—E. G. CHEMUNY, of Philadelphia, Pa.—*Improved Registering Apparatus*.—Patent dated December 21, 1858.—It is a semi-circular plate, having formed in it a spiral groove, which is divided into two parts, said slot is to accommodate a thumb screw A, which projects through it from the rear D, and by which the said arm D is retained at any point in the arc of revolution.

*Claim.*—I claim, first, constructing the screw A and B in two parts swivel together as specified, in combination with the adjusting screw shaft C, the whole arranged to rotate electrically. *Second.* In combination with the screw adjustment of the movable shoe, the arrangement of the pencil or dry point carrier G, on a screw shaft G, in order that the pencil or carrier G may be readily varied to the smallest extent, or a series of concentric circles be drawn varying very slightly in size.

*Third.* Arranging the registering apparatus with a vibrating adjustable arm D, on a vertically adjustable arm B, as described for the purpose set forth. 163 D

No. 20,796.—SAMUEL GARLAND, JR., and LEVI BROWN, of New York, N. Y.—*Improved Electric Light*.—Patent dated June 22, 1858.—Who claim and engraving will explain the nature of this invention. *Claim.*—The combination of a platinum coil C, or its effective equivalent,

which is illuminated by electricity with a transparent signal lantern B; said combination being effected by arranging the coil C nested with the lantern B upon two conducting wires D, which are connected with an electro-galvanic battery.

No. 21,656.—JACOB D. CURTIS, of Worcester, Pa.—*Improvement in Fog-Signal Machine*.—Patent dated October 13, 1858.—The nature of this invention consists in furnishing fog-signal machines, magnetic retaining power, on the reaction points of a spiral wire and platinum to graduate so as to keep the proper balance of power in time of winding, so that the machine shall not run out or gain, and which retaining power shall be convenient to oil, and set to work in any other part of the machine; the screw-wheels and plenums all being on the outside where they can be made up or adjusted. *The inventor says:* I claim the application to fog-signal machines, magnetic telegraph registering machines, &c., of my improved retaining power, including plenum I, wheel J, shaft K, piston L, wheel M as above described, to form an adjustable and durable retaining power, substantially as set forth. 163 E

No. 21,688.—HENRY MARSH, of Philadelphia, Pa.—*Improvement in the Mode of Insulating Magnetic Indicators on Batteries*.—Patent dated October 6, 1858.—The claim and engraving explain the nature of this invention. *Claim.*—Securing to a railroad a series of conducting rails independent of those of the track, and placed so as to be in electrical communication with the next pair throughout the series, and each pair on the train by the devices described, with galvanic battery, each pair to one pole, and the other to the other pole of the said battery, and the latter being connected with the rails, so that the apparatus situated on the train as set forth for the purpose specified.

No. 20,402.—WILLIAM DOTE, of Washington, D. C.—*Improved Mechanism for Operating Semaphore Signals*.—Patent dated November 1858.—The nature of this invention consists in the combination and frame, their colors being red, white, and black flags stretched on irrefragable or other material, and each flag may be set by means of equivalents, and each moved. Being so arranged, that the motion of the other two flags, by the movement of the other two flags, be produced and lowered of pleasure. *The inventor says:* I do not claim the combination of the red, white, or black flags, whose position represent certain figures, letters, or words. But I claim the particular mechanism, described and shown, for fully as set forth.

to be carried along with the conductor, in such a manner that which are included a number of steel lumps, in such a manner that the lumps in one circuit only may be lighted simultaneously by means of the other circuit.

*Second.* The combination of a circuit-changer with devices for operating by electricity such a circuit-changer in a station, &c., &c.

*Third.* The arrangement of the magnet A, the brass plate G, the lever D, and the pawl B, substantially as and for the purposes described.

No. 19,467.—ARCHELAE WILSON, of Boston, Mass.—*Improved method of lighting Gas by Electro-Galvanic Batteries*.—Patent dated February 23, 1858.—The circuit of the battery F is closed by means of a reformed magnetic, and the armature G is drawn towards the battery A and brings the coil of the platinum wire C into contact with the pole of the tip g, at the same time the points L are brought into contact with the spiral strips K, which are connected with the two poles of the battery I, and the circuit of this battery is thereby completed, and the gas becomes heated and ignites the gas as it escapes from the tip of the burner. *The inventor says:* I claim combining with a gas or other burner a vibrating electric conductor, substantially as described for the purpose specified, so that after producing ignition the conductor shall be removed from the flame, substantially as described.

And I also claim the employment of the metallic corner of an electro-magnet with the combined vibrating electric conductor and burner, substantially as described. 163 F

No. 19,170.—JAMES THORP, of Mobile, Alabama, assignor to JOHN A. BATTLE, of Mobile, Alabama.—*Improved Method of Registering the Speed, and also Forward, and Distance passed over by Railroad Trains by means of Electro-Galvanic Batteries*.—Patented in England February 19, 1857; patented in France June 18, 1857.—Patent dated January 19, 1858.—The claim and engraving explain the nature of this invention.

*The inventor says:* I wish it to be particularly understood that I do not confine myself to the use of any of the particular mechanical devices described, nor to the use of any particular marks or characters in the several registrations, as such may be varied and modified without departing from the principle of my invention.

But I claim, first, the method of recording the performance of a railway train on its journey by the combination of a registration of time, and one or more registrations of distance, such registrations being made in lines parallel with or converging towards each other by comparison with each other the speed, movements, and stoppages of the train, substantially as specified.

*Second.* The indication of the backward movements of the train by a registration of a different character to that of the forward movement, but in the same relation to the registration of time, so as to show the time occupied and the distance passed over in backing, and

No. 19,819.—OZAY WHITE, of Racine, Wisconsin, assignor to HENRY C. JAMES, of said Racine.—*Improvement in Lighting Conductors*.—Patent dated March 20, 1858.—The claim and engraving will explain the nature of this invention.

*The inventor says:* I claim, first, a lighting conductor consisting of iron wires encased by a sheet copper, for the purpose of increasing the strength and the conducting power of the rod without materially lessening its flexibility or greatly increasing the expense of manufacture, as set forth.

*Second.* The said metal joint or clutch L, for connecting the additional rods or points to the main rod, as described.

No. 20,916.—VICTOR SCHMIDT, of Cincinnati, Ohio.—*Improved Device for Securing Lightning-Rods*.—Patent dated July 13, 1858.—The nature of this improvement consists in forming the rod d of a metal of a spring d with the insulator a, with the combined arrangement of the insulator a, and the rod d, so that the rod d is an insulator over the ends of the rod d, without having to slip the insulator over the ends of the rod d.

*The inventor says:* I am aware of other arrangements for securing the same purpose, and therefore do not broadly claim attaching and detaching rods after the manner and with the means represented for the purpose described. 163 G

No. 21,905.—SARAH A. G. REEBS, of Boston, Massachusetts.—*Improved Method of Insulating Supporting Lightning-Rods*.—Patent dated October 20, 1858.—The insulator cup, as shown in the engraving, is cylindrical in form, and made hollow to receive an insulating shell of any material, or other suitable material, by which the cup may be electrically insulated from the shank, or part L, which serves to support it. The supports of the two insulators D' are shown as sustained in position by screws.

*The inventor says:* I claim making the insulator cup c with the rate substantially as described, and arranged so as to operate satisfactorily as described.

I also claim combining with the rod, or conductor, an adjustable nut or screw, applied to it and the insulator cup, substantially in the manner and so to operate as specified.

I also claim combining with or arranging in the cup c of the hook applied substantially in manner and for the purpose set forth.

No. 22,158.—N. M. McLEOD, of St. Louis, Missouri.—*Improved Supporting Insulator for Lightning-Rods*.—Patent dated November 30, 1858.—This invention involves no new principle, but it consists in means of securing the rod to the insulating material, and securing the rod to the insulator and the insulator to the building, &c., &c.

*The inventor says:* I claim so cutting the groove in the edge of the plate n to form the elliptical hole, shown at A', whereby the insulator is secured to the building in the manner specified. I also claim the combination of the insulating material, constructed and arranged with the pole of the conductor, constructed and arranged so that the insulator is secured to the building in the manner set forth for the purpose specified.





No. 13,162.—ROBERT D. DWYER.—Improvement in *Structure for Lightning Rods*—Patented July 9, 1856. (Plates, p. 160.)

The following is a summary of the invention: A) will be securely fastened together, and the rod be securely fastened to them. B) Constructing a lightning-rod holder of two parts, each of which the lightning-rod will connect them to each other at the same time that it connects itself securely with them, substantially as represented and set forth. 160

No. 12,855.—CHARLES T. CHURCH.—Improvement in *Constructing Chains for the Plates of Galvanic Batteries*—Patented May 10, 1856. (Plate, p. 14.)

FIGURE 1 represents a top view, and figure 2 a perspective view, of the clamp C<sup>1</sup> adapted to connect a duplicate plate in the battery fluid, with the other is removed. Thus C<sup>1</sup> is placed upon the battery fluid, P<sup>1</sup> is a set screw, as shown in figure 1, and held in that position by a screw, w, while the auxiliary zinc plate Z<sup>1</sup> is secured into clamp C<sup>1</sup> as top into the same and into which Z<sup>1</sup> dips. Z<sup>1</sup> is then removed or C<sup>1</sup> is replaced, and the battery current will have been interrupted. Claim.—The arrangement herein described for fastening and connecting the battery-plates, viz: Clamps H, of brass or such other metal, having legs A, of wood, commonly used in Storer's battery, in such form as will allow the purpose of the arrangement, attached to the insulator that the battery-plates Z<sup>1</sup> clamped to them shall be separated from the wooden bars, and the solution be prevented from finding its way by capillary attraction to the wood, and which shall be their form without the disturbance of any other part of the battery arrangement, as herein above set forth. 167

No. 12,619.—ORRIS D. VANCE, of Boston, Mass., assignor to Hiram F. KERRAN, W. M. MERRILL, and Charles W. LORING, of Lowell, Mass.—Improvement in *Method of Making the Plates of Galvanic Batteries*—Patented August 12, 1856.—This invention relates to a method of applying a thin layer of zinc to the surface of the plates of galvanic batteries, and to the construction of the plates themselves. The method is as follows: A solution of zinc sulphate is prepared, and a thin layer of zinc is deposited upon the plates of the battery by electrolysis. The plates are then washed and dried, and are ready for use. Claim.—The method of making the plates of galvanic batteries, as herein above set forth, and the construction of the plates themselves, as herein above set forth, and the apparatus for carrying out the same, as herein above set forth. 167

No. 12,522.—EDWARD METZGER, of Brooklyn, N. Y., assignor to Hiram F. KERRAN, W. M. MERRILL, and Charles W. LORING, of Lowell, Mass.—Improvement in *Method of Making the Plates of Galvanic Batteries*—Patented August 12, 1856.—This invention relates to a method of applying a thin layer of zinc to the surface of the plates of galvanic batteries, and to the construction of the plates themselves. The method is as follows: A solution of zinc sulphate is prepared, and a thin layer of zinc is deposited upon the plates of the battery by electrolysis. The plates are then washed and dried, and are ready for use. Claim.—The method of making the plates of galvanic batteries, as herein above set forth, and the construction of the plates themselves, as herein above set forth, and the apparatus for carrying out the same, as herein above set forth. 167

No. 11,416.—AMI DAVIS.—Improvement in *Magneto-Electric Machines*.—Patented August 1, 1854. 167  
This invention relates to an arrangement of the machine so to make only one conducting spring (C) necessary, and instead of making the joint-piece a piece of metal, and insulated from the shaft. Claim.—I claim as my invention the construction of the journal of a shaft, in combination with the single conducting spring in electro-magnetic machines, as herein described. 167

No. 10,406.—JOHN M. BACHMANN and MOSES G. FARMER.—Improvement in the *Work of Constructing Connections with an Electro-Magnetic Coil for the Travelling Carriage of a Telegraphic Battery*—Patented February 7, 1854. 167  
The battery wires, P, N, are run along a series of bars, y, y, y, y, of the series being printed at a to the fixed base of the whole machine, and the other to the travelling carriage B, a section of which which is seen in the engraving, and which is designed to carry the marking apparatus, and cause it to traverse the length of a cylinder wrapped with the paper upon which the message is to be written. Claim.—The combination of the system of progressive levers with the battery wires, the base-board, and movable platform, in its use to operate substantially as specified, and for the purpose set forth. 167

No. 11,639.—THOMAS U. WEAVER.—Improved *Mode of Insulating Lightning Rods and securing the Insulation*—Patented August 16, 1854. 167

The improvement in the construction of insulators which it claims consists in making the inner surface convex, as represented. This, with the outer conformation represented by the drawing, presents a circular surface both inside and out, making the thickness of the insulator uniform in all parts; a construction which combines the greatest strength with the greatest economy of material, and by having the least possible resistance to the pressure or expansion of the air produced by the lightning, renders less liable to be broken by the lightning or any other cause. Claim.—I do not claim making the outside of the insulator with a horizontal groove in the middle and a flange on each side of the groove. But what I do claim is, making the inner surface convex, in the manner and for the purpose specified. 167

No. 10,449.—JOHN H. BROWN, Mass.—Improved *Electric Machine*—Patented June 21, 1854.—This improvement relates to the battery of the machine, by means of a chain, or wire, and the movable or sliding contact.

By which the machine is started or stopped at pleasure, both the battery and the contact being in the same position, and the machine being in the same position. The combination of the battery and contact in the same position, and the machine being in the same position, and the machine being in the same position. 167

No. 10,449.—JOHN H. BROWN, Mass.—Improved *Electric Machine*—Patented June 21, 1854.—This improvement relates to the battery of the machine, by means of a chain, or wire, and the movable or sliding contact.

By which the machine is started or stopped at pleasure, both the battery and the contact being in the same position, and the machine being in the same position. The combination of the battery and contact in the same position, and the machine being in the same position, and the machine being in the same position. 167

No. 11,652.—J. DONOVAN HEWITT.—Improvement in  *Machinery for Coiling Telegraph Wires*—Patented August 22, 1854. 167

I am aware that it has been attempted to coat wire with gutta serena by means of a cylinder, in which is fitted a piston, and having pressure on one side of the piston of the wire, the other side of the piston being of the size of the wire when coated; and the coating being applied by the pressure of the piston while the gutta serena is in a melted state, by heat applied externally to the cylinder, and sliding. I do not claim broadly the coating wire by drawing them through a second having holes or opposite sides. Claim.—But I do claim the employment of the mangle-roller, with or without the mangle-rolls, provided and combined with an aperture covered with a cloth of India rubber or its equivalent, having a hole or opening in the center which is of the size of the wire, and the thickness of the continued compound, and with the mangle-rolls or die, bearing the thickness of coating of compound to be put on the wire, substantially as used for the purpose, and for the purpose set forth. Also, I claim the use of the cone (which determines the thickness of the coating) in such manner as that the outer end or inside thereof, when in use, terminates in a sharp point, and the inner end is covered wire shall emerge from the cone directly into or within the mangle-rolls, in the water, through which the wire will then pass, as hereinbefore described, for the purpose of coating the composition. And, finally, I do not claim the use of the apparatus solely for the purpose of coating telegraph wires, but it may be applied and useful for other equivalent uses, of all which I claim. 167

No. 10,455.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

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No. 12,056.—GALLEN BOWELL.—Improvement in *Operating Levers, Electricity*—Patented December 11, 1854. Patented in France August 16, 1853. 167  
Claim.—The application of electricity, or of electromagnets, to power-levers, in order to operate the same in the manner of the levers and handles, in the quaternary order for the design of parts of mechanical suit, such as shafts, cranks, pistons, &c., as described. Also, the various means of operating the same, by means of the same, by means of an insulating material, and the use, for this purpose, of varnish, or wax, or paper painted or colored with insulating substance, of paper cut, or pinched, or pierced. 167

No. 9,519.—THOMAS C. AVERY, of New York, N. Y.—Improved *Electric Machine*—Patented October 11, 1853.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

No. 10,459.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

No. 10,460.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

No. 10,461.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

No. 10,462.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

No. 10,463.—GEORGE W. HERRICK, of Plattsburgh, N. Y.—Improved *Electric Machine*—Patented June 21, 1854.—This invention consists in the employment of two oppositely directed magnets, instead of four, with other and substantially equal by the alteration of their relative position, which conductors are placed between the two sets of conductors, and are connected with one of the terminals of a magnetic battery, so that the vibration shall have the same effect as if the magnets were placed on one side of the wire, and the other side of the wire connected with the other terminal of the battery, and the wire with the other terminal of the battery. Claim.—The mode of operation of the pole-changer, by which the current is made to flow in the one direction alternately. 167

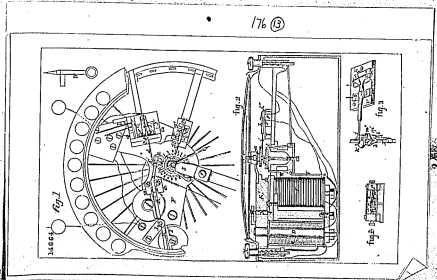
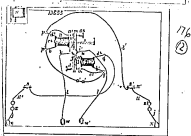
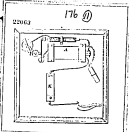
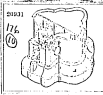
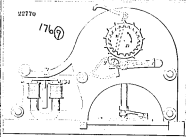
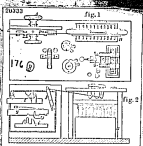
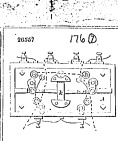
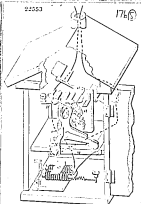
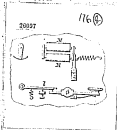
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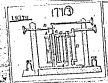
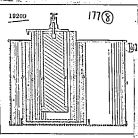
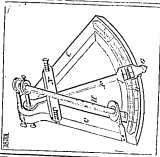
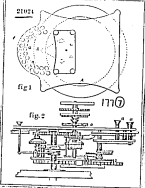
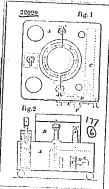
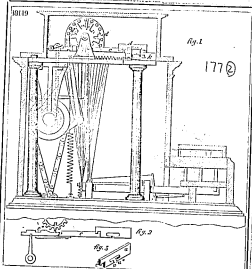
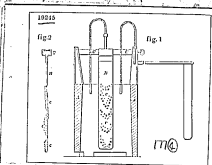
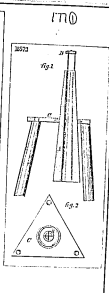
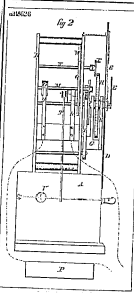


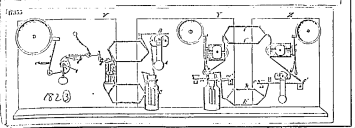
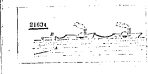
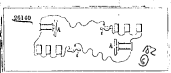
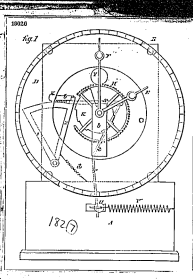
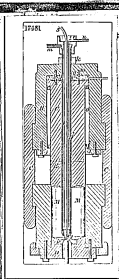
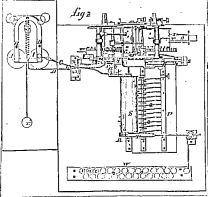
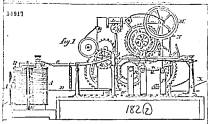
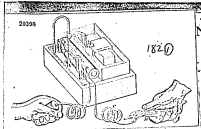


be controlled by the irregular movement of other parts of the telegraph apparatus.

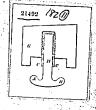
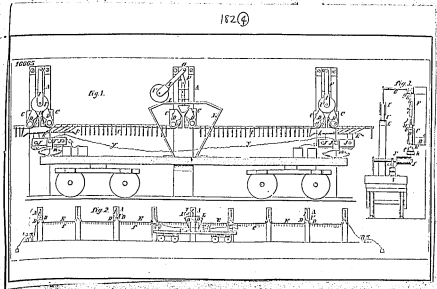
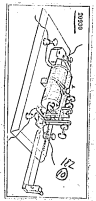
The chain sending and receiving signals, as stated, by apparatus so arranged and combined with the main combinator that, in operating, the impulse that closes or opens the circuit shall last but for a moment, while the contact maintained at the station where the signal is received shall last a longer period, so as to insure the accuracy of exact synchronism in the movements of the mechanism at the two stations.







SACHSREISEN VON



183

## APPLICATION OF Electro-Magnetism to Bank Locks.

For several centuries mechanical ingenuity has been exercised to construct locks, which would defy the efforts of burglars to pick or force open. The general public has always taken great interest in this contest between invention and dishonesty, and every improvement in the art of Lock Making has been received with satisfaction, alike by the commercial community, who are more directly interested, and all persons who delight in the discomfiture of thieves.

Many of us remember the time when the size and weight of the key was considered the great desideratum in a lock. A four door key contained enough iron to make a phlogiston, and the keyhole was about the size of a goose's head. This falling exploded, it was next the object of the lockmaker to make his key as small as possible, which was a great improvement, and next the introduction of the Dial Locks was considered the best form for lock keys. The dial lock, as everybody knows, dispenses entirely with the use of the key, and is worked by means of a spindle running through the door of the safe. This spindle is considered by safe men to be one of the weak points of a burglar proof safe, and its possible abolition has for some time been a matter of speculation among some of our best safe makers.

We do not propose to enter into a discussion of the "pickability" or security of the dial locks. Those persons interested of the frequent robbery of our banks and public offices can judge for themselves by these facts, while those acquainted with the use of the "Morse" and the results of what are known as "Honest Lock Contests" between the leading manufacturers of this class of locks, can form their opinions upon the possibilities of the race.

The application of Electro-Magnetism to Bank Locks is the result of long and careful study, and is for the first time exhibited to the public at the American Institute Fair of 1876. The advantages of the Electro-Magnetic Combination Lock over all others are:

- I. It abolishes the use of the key, the keyhole, the spindle, and the dial, thus preventing the possibility of drilling or blowing open the lock.
- II. The only force or agent employed being electricity, which is intangible, none of the masses can be employed to open it, thus rendering it impickable.
- III. The lock need not necessarily be placed upon the door of the safe, but may be affixed to the lock or safe, or if there be an inner safe the lock can be placed inside the inner safe, and the same lock need not unlock both the outer and inner doors with different combinations.

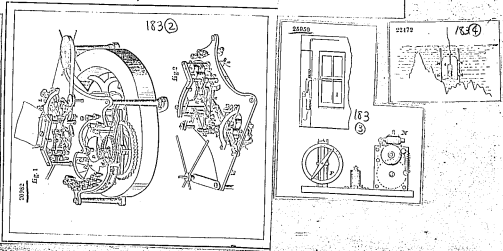
IV. The operation of opening the lock is so simple that it is at once understood and remembered. The lock exhibited has seven combination wheels, giving 2,709,000,000,000 different combinations. It can be opened inside of two minutes, and the combination changed at any time the safe is open with facility and ease.

That the lock is perfectly impickable in all cases claims to say one understandingly examining it, and it not only gives perfect security against the contrivances of thieves, but also does away with the weakest point of a burglar proof safe as at present made, viz. the keyhole or spindle of the lock.

The inventor admits it is necessary in the public with the conviction that he has at last accomplished that which has heretofore been considered well nigh impossible—a lock which can defy the dishonest and give absolute security to those using it.

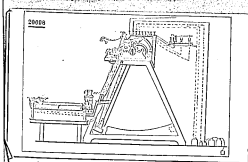
SEPTEMBER 1st, 1876.

ELECTRO-MAGNETIC BANK LOCK CO., 1830  
OFFICE, No. 9 WILLOUGHBY STREET,  
BROOKLYN.

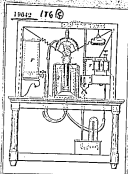


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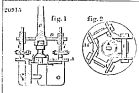
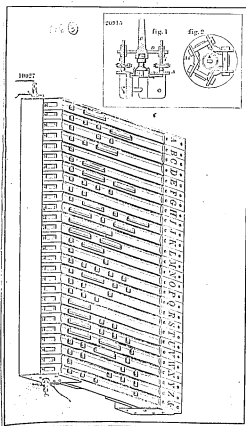
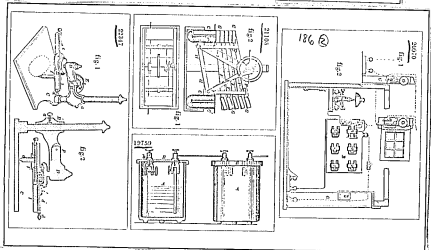




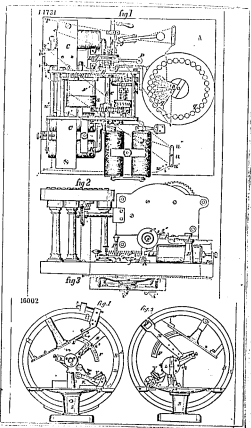
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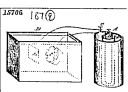
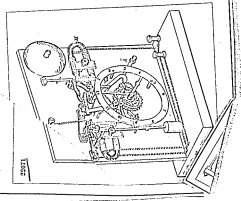
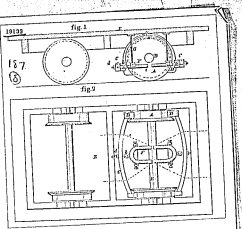
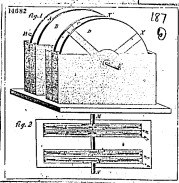
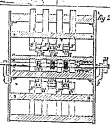
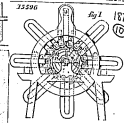
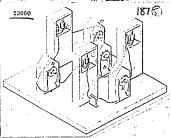
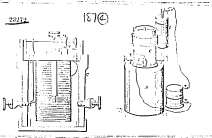
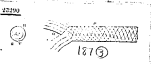
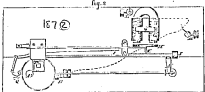
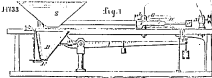
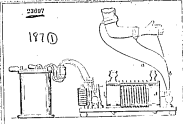


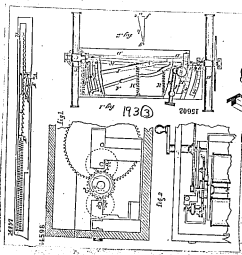
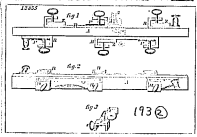
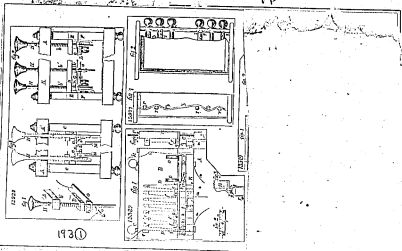
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# Patent Combination Stencil Alphabet,

For Marking Shoe Cords, Boots, Bags, Trunks, &c.



The regularity and ease with which one can mark with the Combination Alphabet and Figures, and the simplicity of its arrangement, has caused it to be welcomed by hundreds upon hundreds of all grades.

For Merchants and Manufacturers for marking shoe cords and other lines; for Boot Retail Agents and others for marked signs; for U. S. Superintendants for printing soap tags, and for Farmers for bags, etc., it is an indispensable essential.

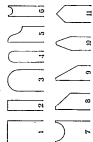
Beside the Alphabet and Figures, we have added the following marks: S, e, M, D, J, E, S, F, 2, H, W, and the combination marks, all set on one piece of brass, so that any letter or figure can be marked instantly. The arrangement is such as to properly space each letter, making the work appear uniform, without trouble to the printer using it.

### PRICE LIST.

2 1/2 inch	82.00
2 1/4 "	75.00
2 1/8 "	68.00
2 "	60.00

1760

Always keep the "S" in the "S" corner down.



These are finished any color and thickness.

### PRICE LIST OF DR. STONES.

1/4 x 1/2	10	7.50	1/2
1/2 x 1/2	25	12.50	1/2
1/2 x 1/2	25	12.50	1/2

MOND TOOLS, \$15.00 EACH.

1760

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74

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read me

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July 14 88

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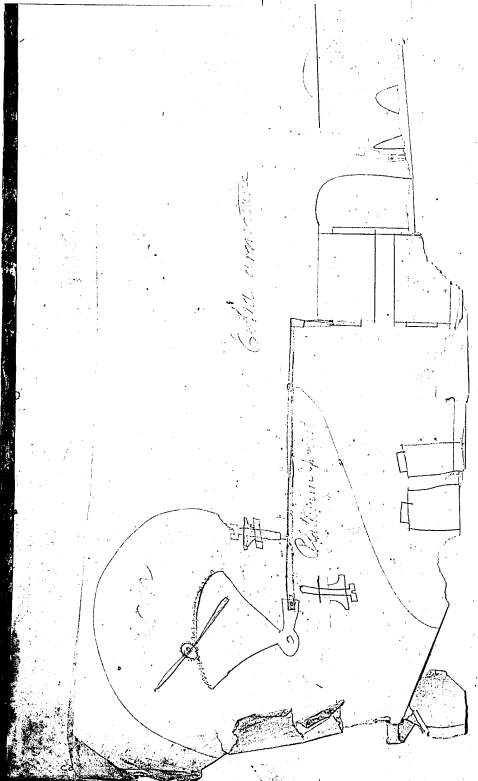
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Laboratory Notebook, Cat. 30,094

This notebook contains only a few dated entries, covering the period April 1871-August 1875. The book consists primarily of undated drawings, ranging from rough sketches to carefully executed drawings accompanied by specifications of dimensions and materials. The drawings relate primarily to telegraphy, including domestic and fire alarm systems and automatic, printing, and autographic telegraphs. Some of the sketches have been drawn directly onto the pages; others have been glued in. The cover is labeled "Sundries Vol. 2." The book contains approximately 200 unnumbered pages. Several leaves have been torn out.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

Handwritten text on aged paper, possibly a letter or document. The text is written in cursive and includes the words "Handwritten" and "Vol 1".



*bedroom*

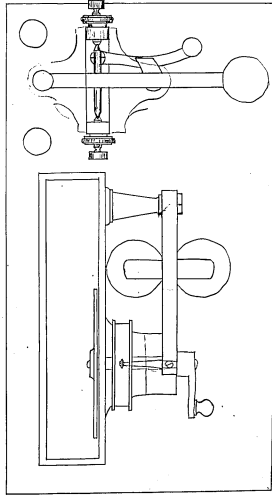
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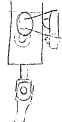
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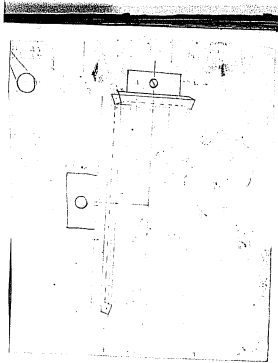
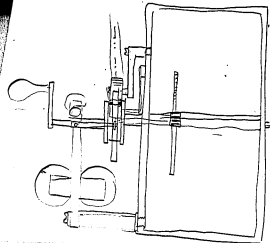


Apr 26<sup>th</sup> 1874  
Wm. S. Burdette

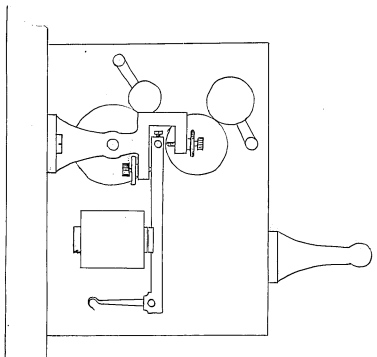
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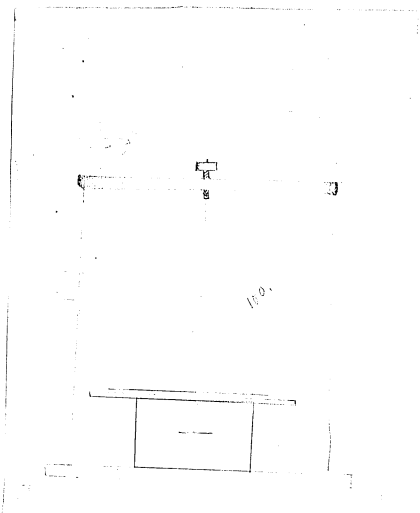


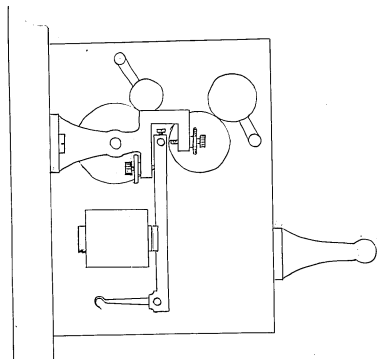


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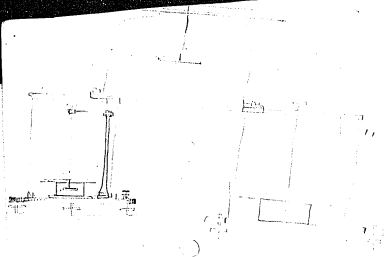


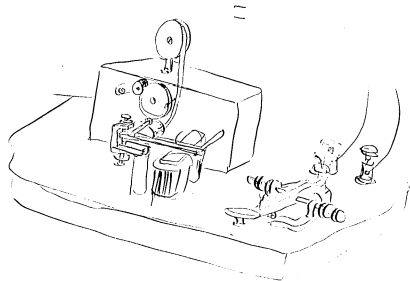
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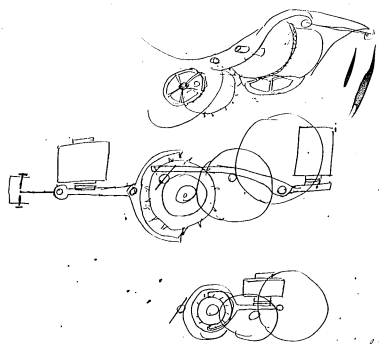
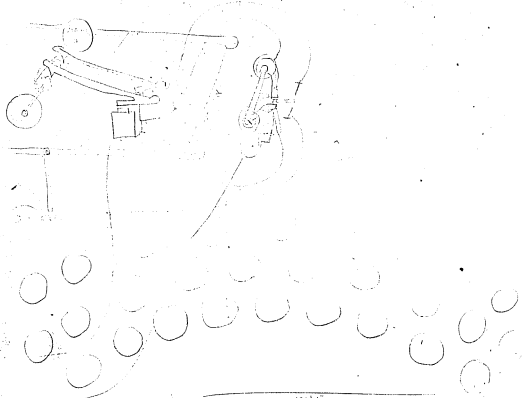


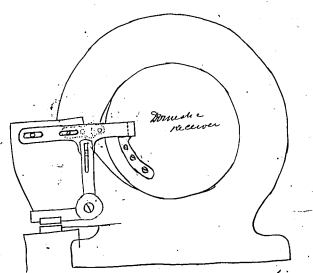
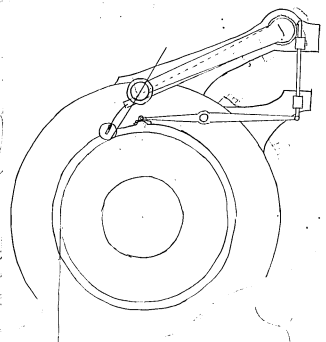
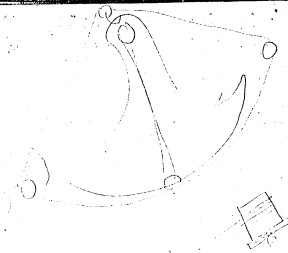
Copy of  
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drawing  
of  
the  
microscope  
shown  
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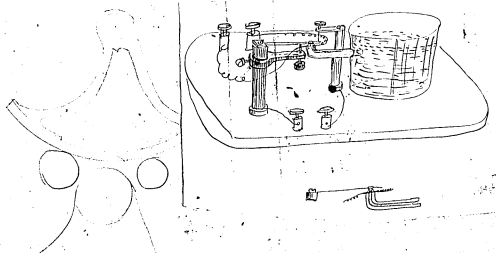
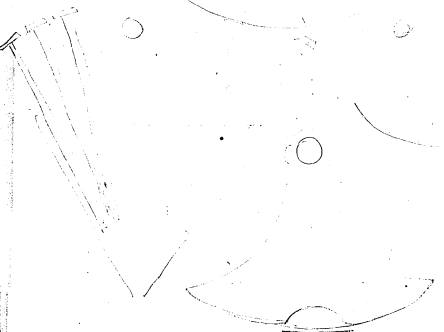
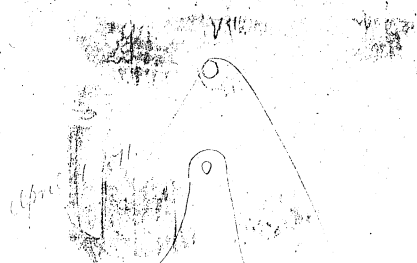


April 7, 1871



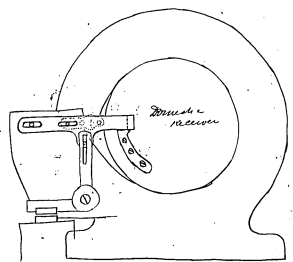
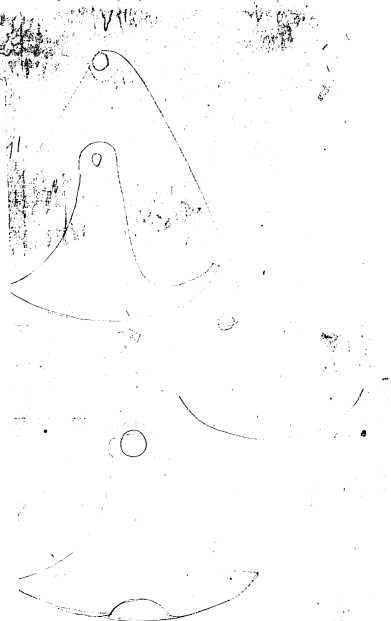


Cartulaire Ann. 1874



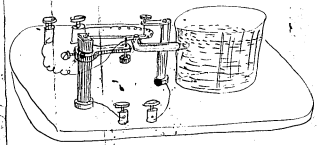


NEWARK, N. J.  
**AMERICAN TELEGRAPH**  
MANUFACTURERS OF  
**MACHINES, SMALL AND LARGE**  
 No. 103 N

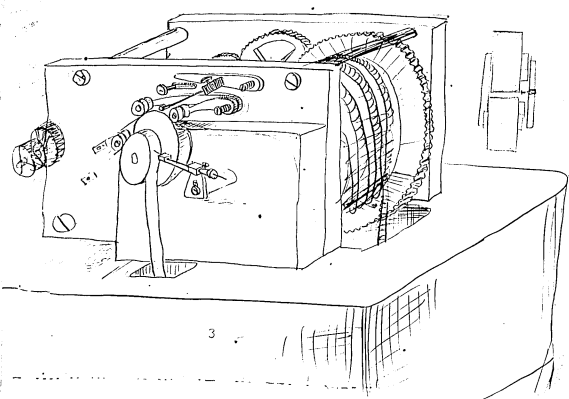
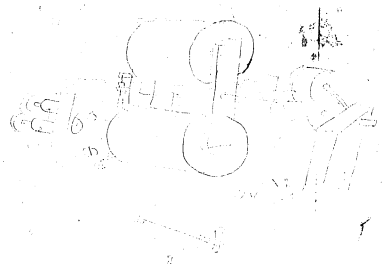


*Ames & Mason*

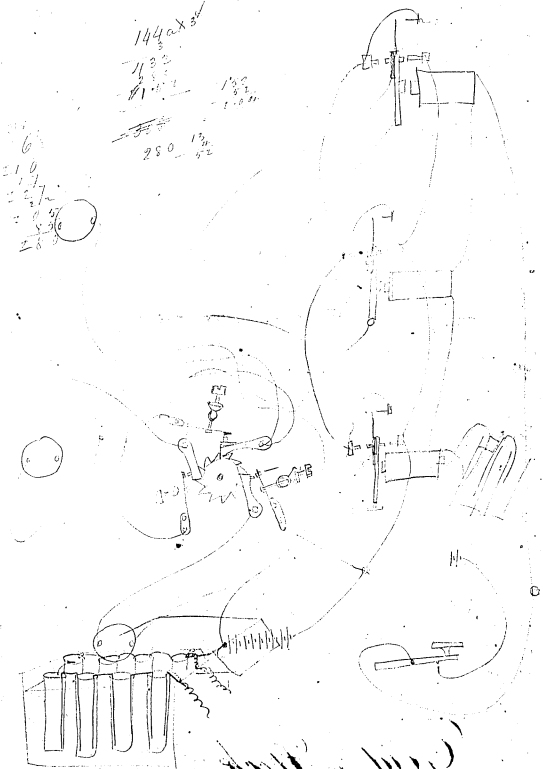
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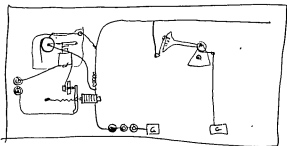
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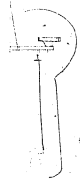
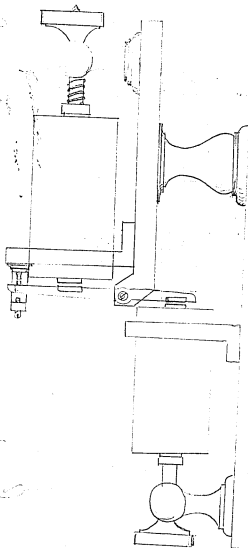
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Spool



Local

FRISCH & UNGER,  
LOCK PRINTERS

U  
 Armature  
 = Piece 2  
 Adjusting Pin For  
 Adjusting Pin for  
 Adjusting Thumb  
 Adjusted Pin

Brass Holder,  
 Binding Post,  
 Screw,  
 Brass-Holder Screw

Clock Pin,  
 Clock Screw, Lock  
 Pin

Bolted and Tap

Longwood Lee  
 Extra Equipment  
 Equipment W1  
 Field of Force  
 Guide Pin and I  
 Guide Screw,  
 Guide Screw

Hook to Base,  
 Hook to Pin

ink Roller Ax  
 Ink Roller,  
 Ink Roller Ax  
 Ink Roller Gro

Iron Wire,  
 Lock Wheel,  
 Link,  
 Link, Screw,  
 Magnet Slide  
 Magnet

Reset

Reset Switch,  
 Metal Plates,  
 Magnet adjusting Screw,  
 Magnet Type Wheel,  
 Printing Lever, Slide, Pin,  
 Printing and Longwood Head,  
 Pin

Paper Roll Holder,  
 Paper Roll Holder, Screw,  
 Paper Roll Hook,  
 Paper Press,  
 Printing Lever

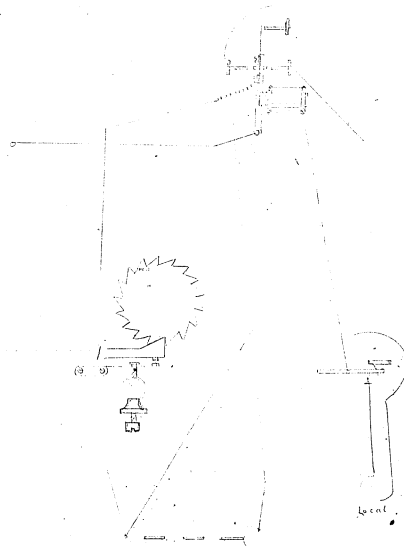
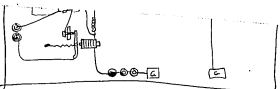
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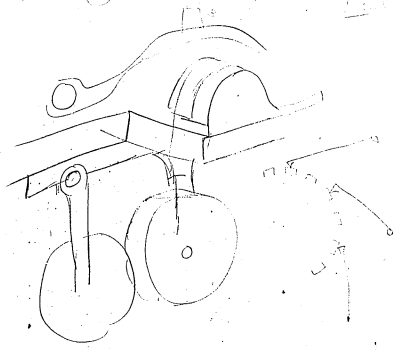
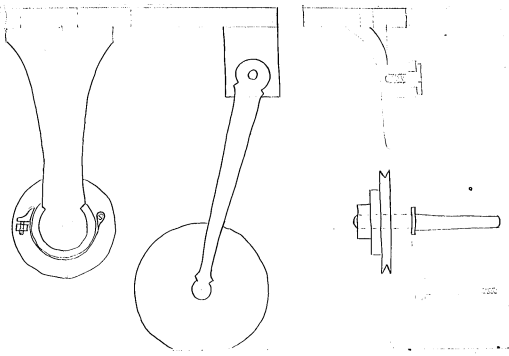
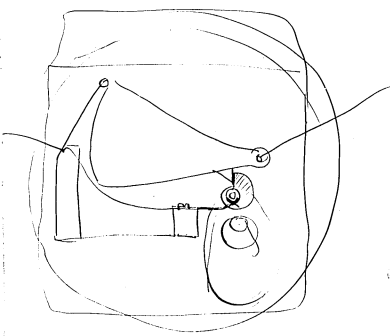
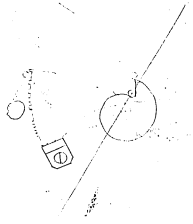
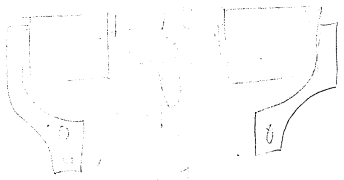
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 Roller Wheel

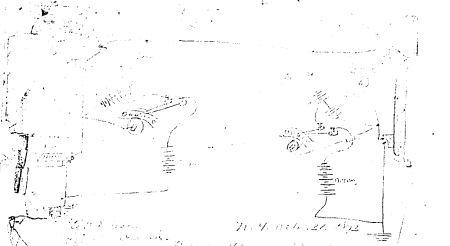
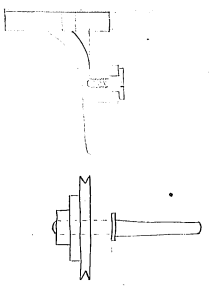
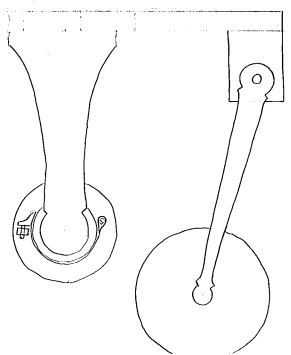
Roller Wheel,  
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Roller Wheel,  
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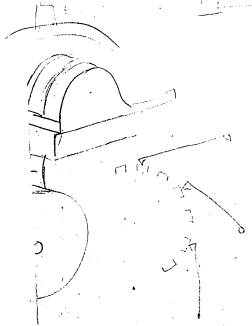
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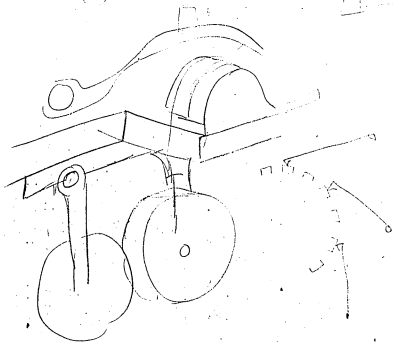
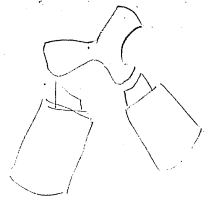
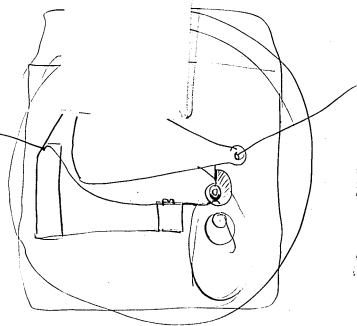
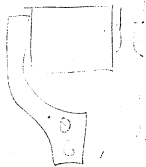


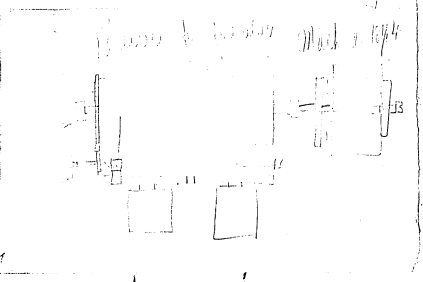
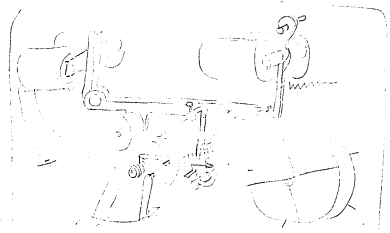




*Handwritten text, possibly a note or description, located below the detailed drawing.*





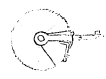
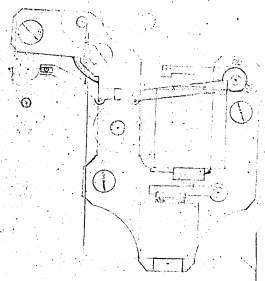


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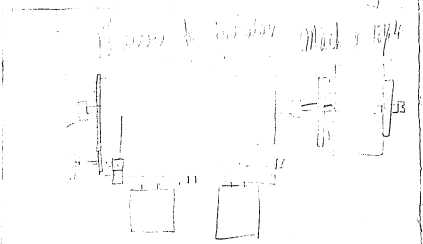
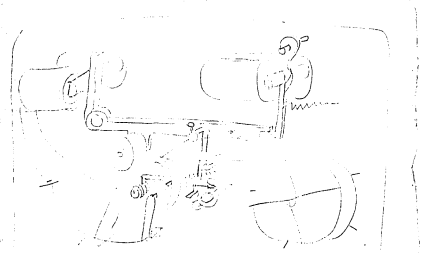


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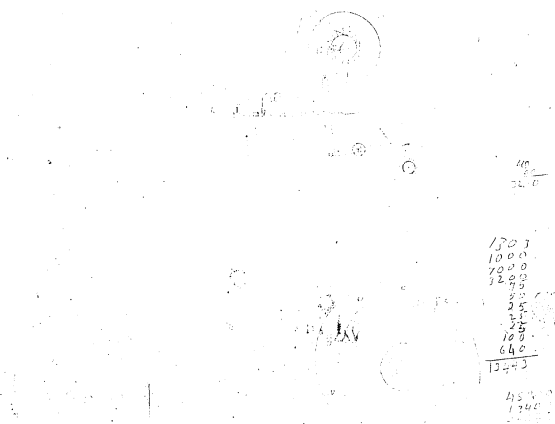
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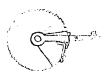
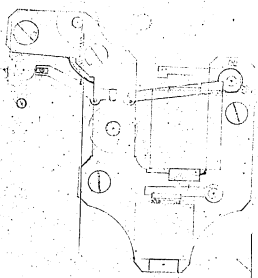
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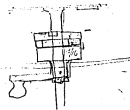
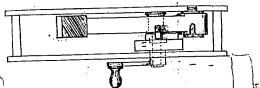
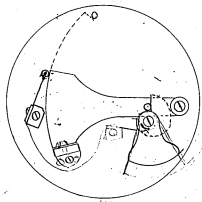
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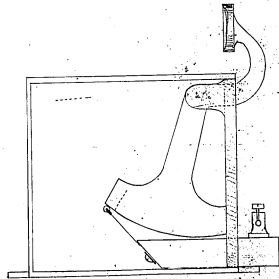
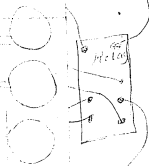
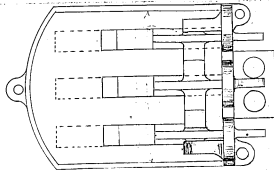


Handwritten note at the bottom right: "Sketch made for the above mentioned"





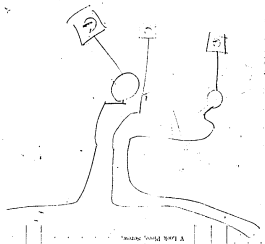
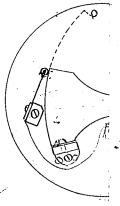
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 10/15/1906  
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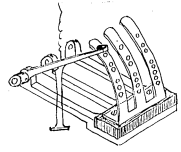
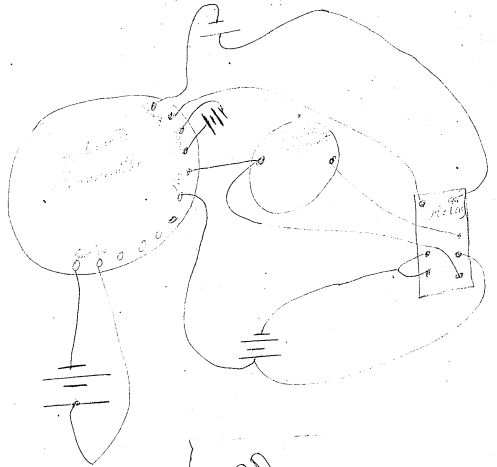
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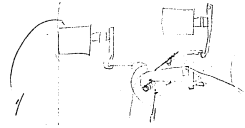


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- Edison Patent, No. 1121
- Edison Patent, No. 1122
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- Edison Patent, No. 1125
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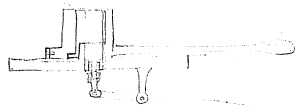
Edison & Unger,  
 183AL STOOK PRINTERS



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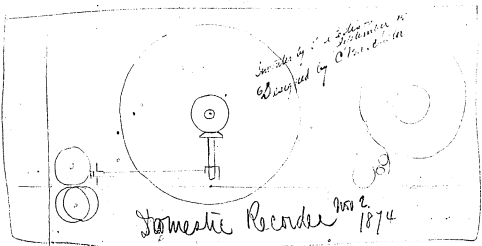


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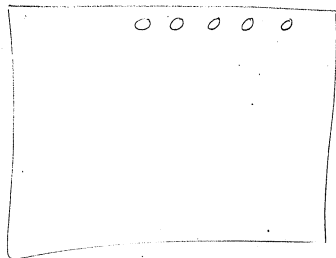
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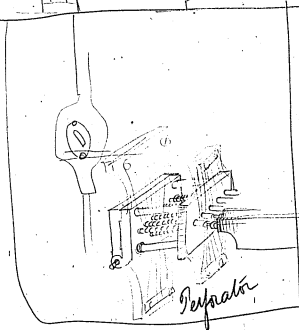
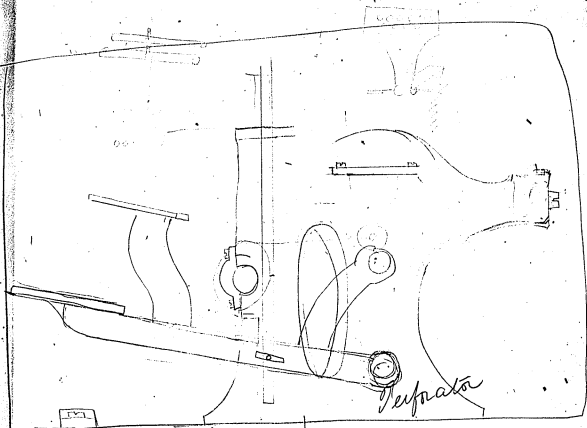
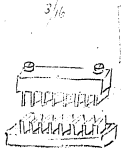
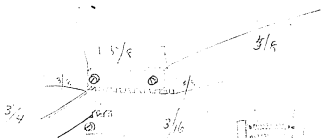
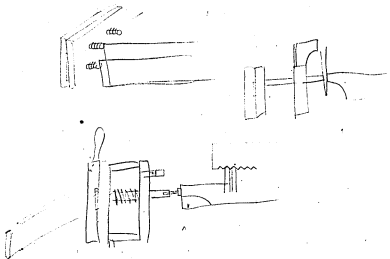
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Designed by A. ...

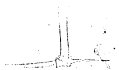
Domestic Recorder No. 2 1874

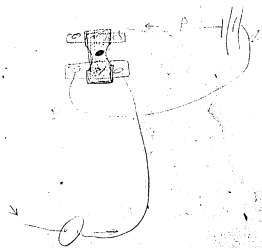
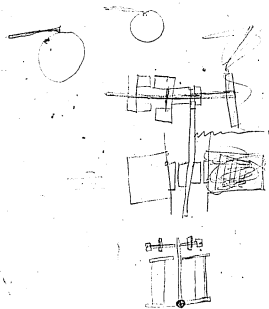


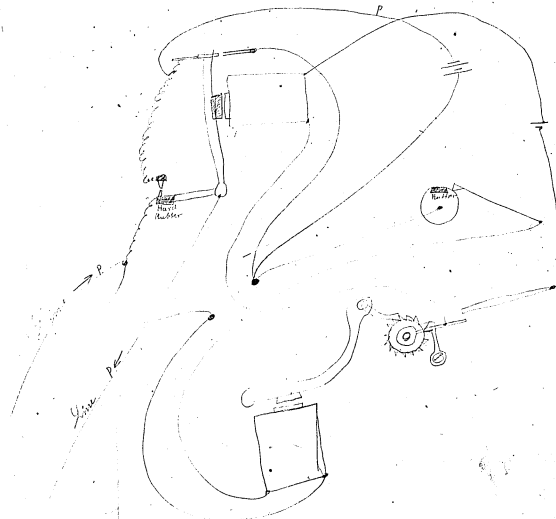
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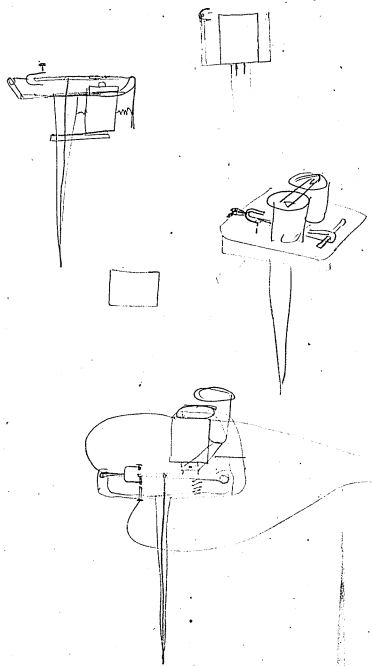


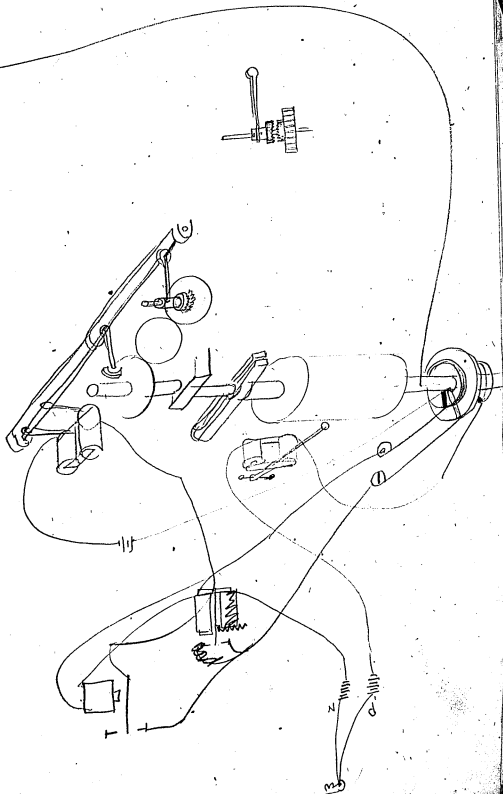
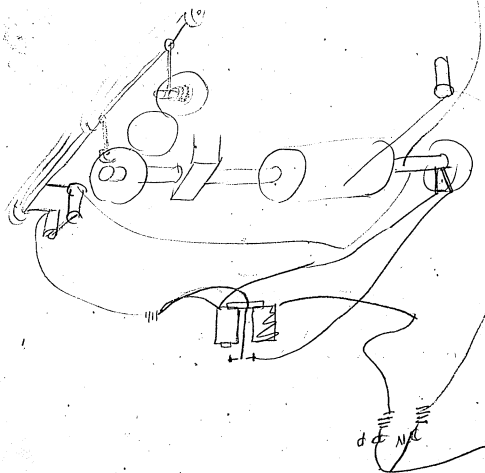


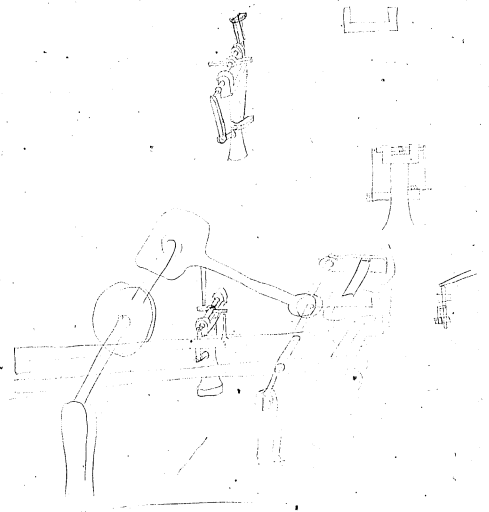


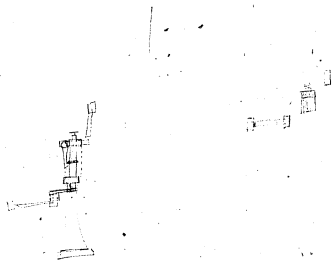
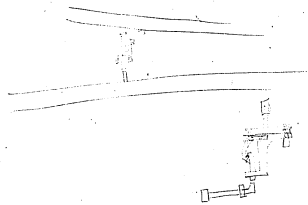
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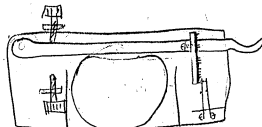
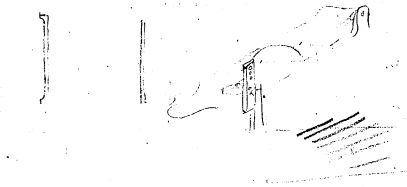
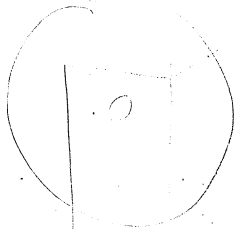






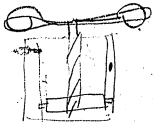


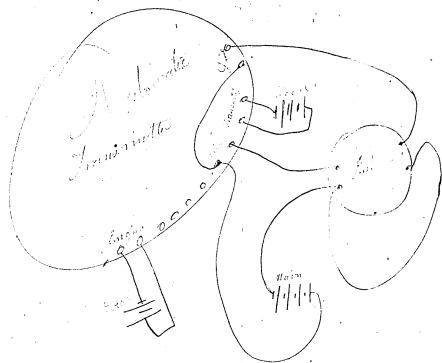




What I want to make a signal box of the ball  
the hole of ball wants bushing with metal & a very  
small little hole made a bush as a to let air in very slow  
just make a rough thing like sketch to see  
if the motor is any thing like loco

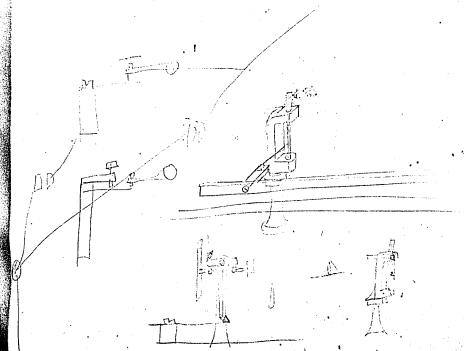
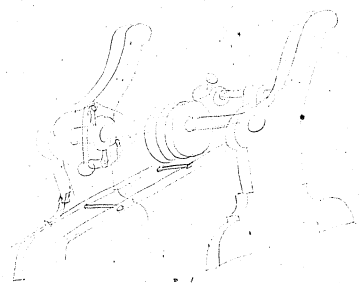
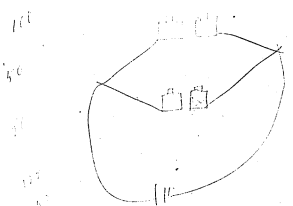
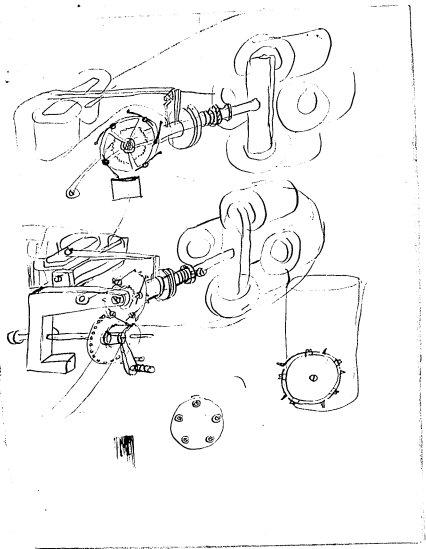
Batchelor

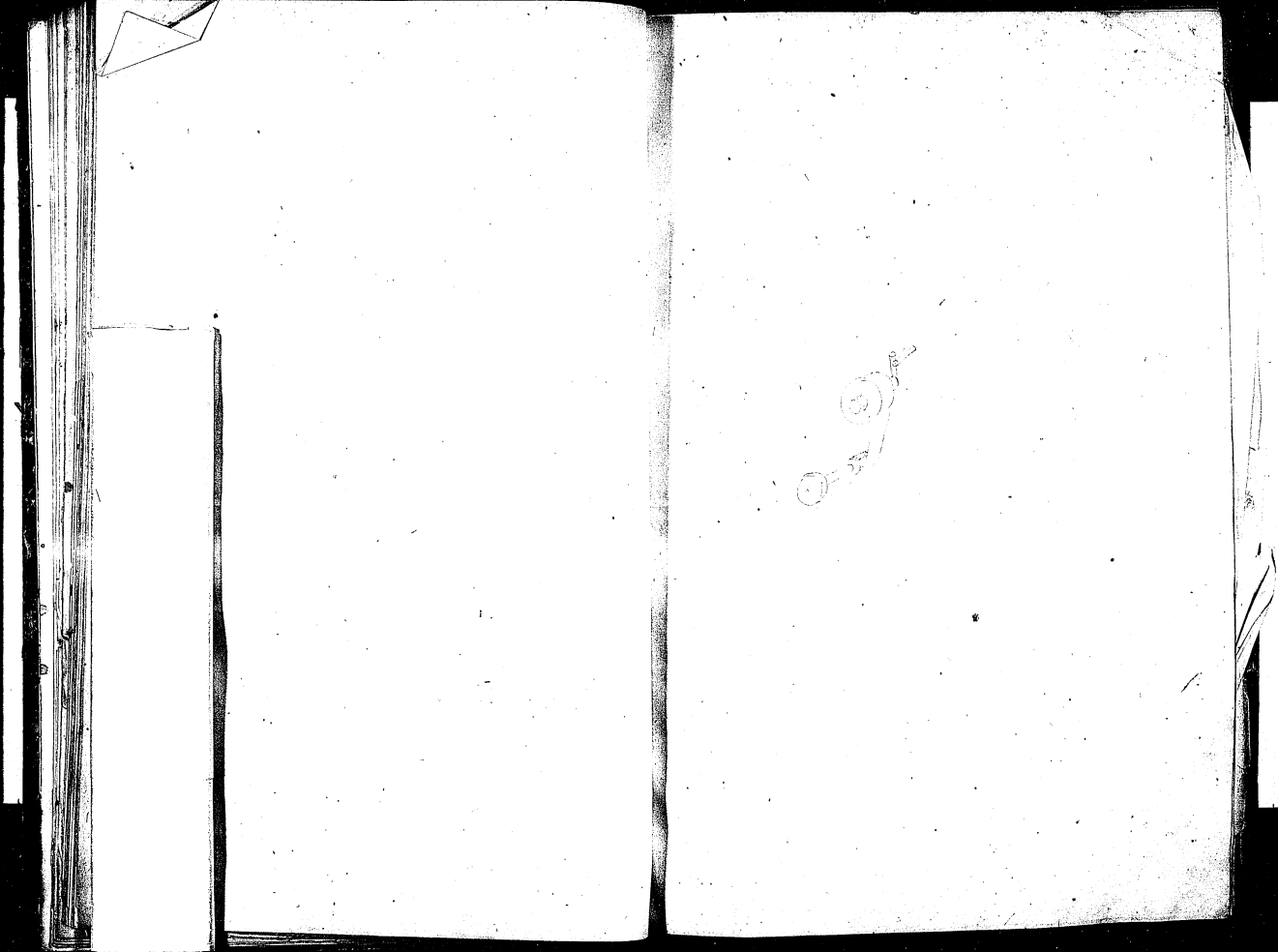




*[Faint, illegible handwritten text]*

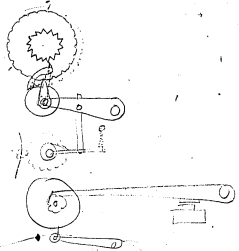
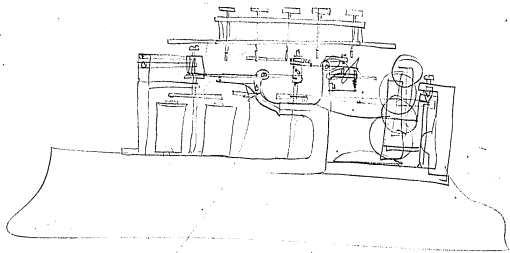
30,000  
 25  
 40  
 500  
 10,000  
 10,000  
 5,000  
 31,000







Automatic Transmitter  
for Andrews' English Printers



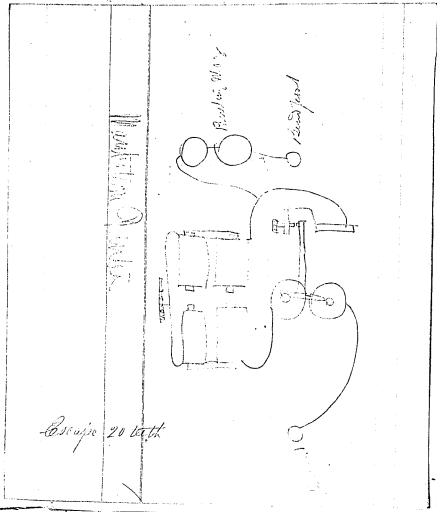
IIII

□

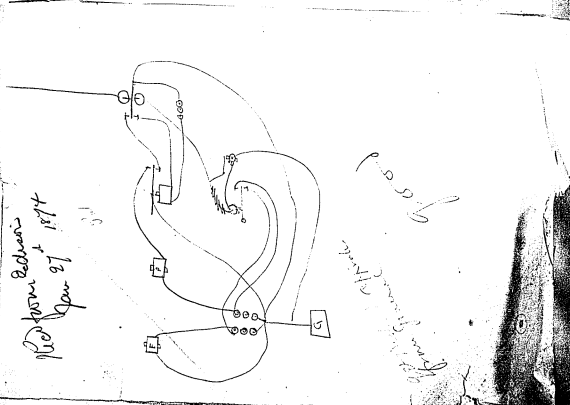
20716
151
5816
1280
6896

140-
11-
151

250

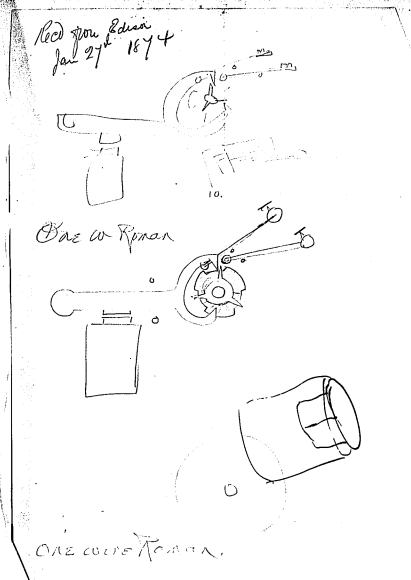


Resistor 20 ohms



Rec'd from Edman  
Jan 27<sup>th</sup> 1874

From Edman  
Jan 27<sup>th</sup> 1874



Dae w Roman

ONE COIL FROM

Rec'd from Edman  
Jan 27<sup>th</sup> 1874



Sheet

Handwritten notes and a list of items:

- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...
- 6. ...
- 7. ...
- 8. ...
- 9. ...
- 10. ...

German Screw Nut

Sheet  
34

Handwritten notes:

- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...



Sheet

Handwritten notes:

- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...

Sheet

Handwritten notes:

- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...

Sheet

Handwritten notes:

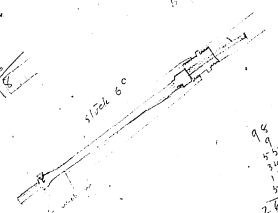
- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...

German Screw Nut

Sheet

Handwritten notes:

- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...



Handwritten notes:

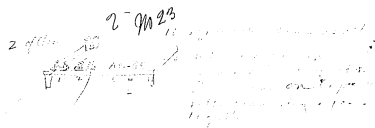
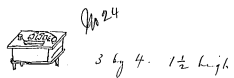
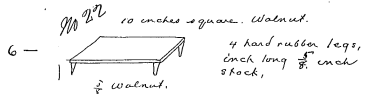
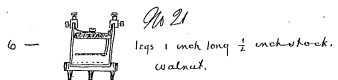
- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...

Handwritten notes:

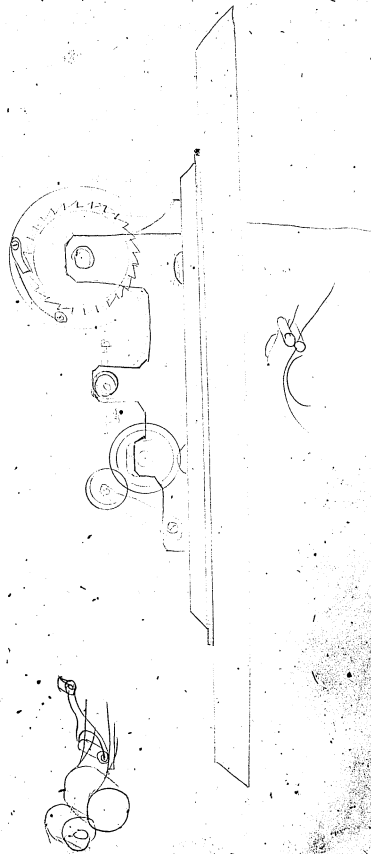
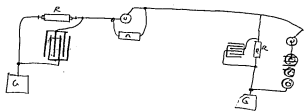
- 1. ...
- 2. ...
- 3. ...
- 4. ...
- 5. ...

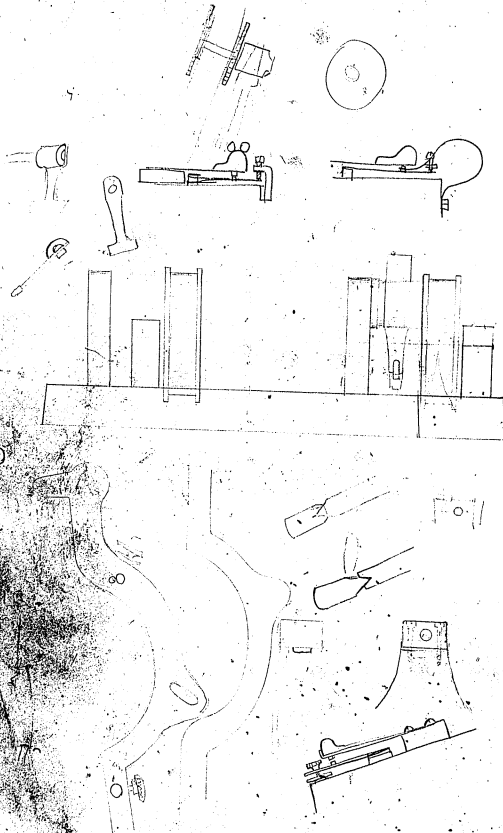


Sheet



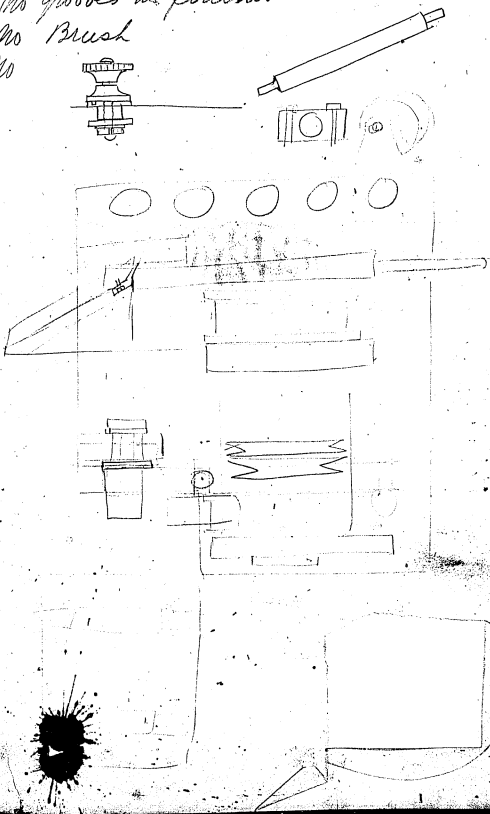
Model.



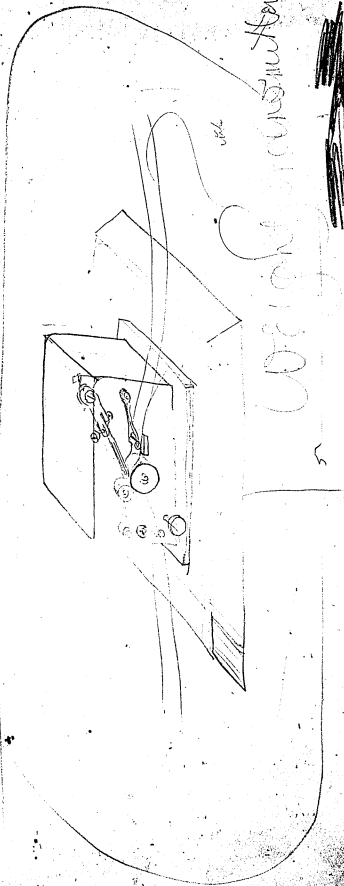
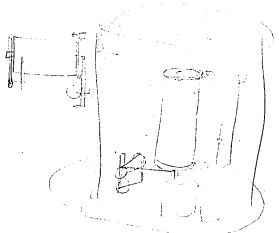
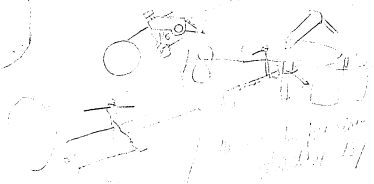
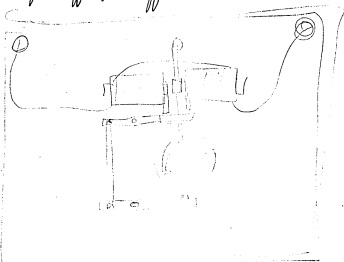


New Transmitter

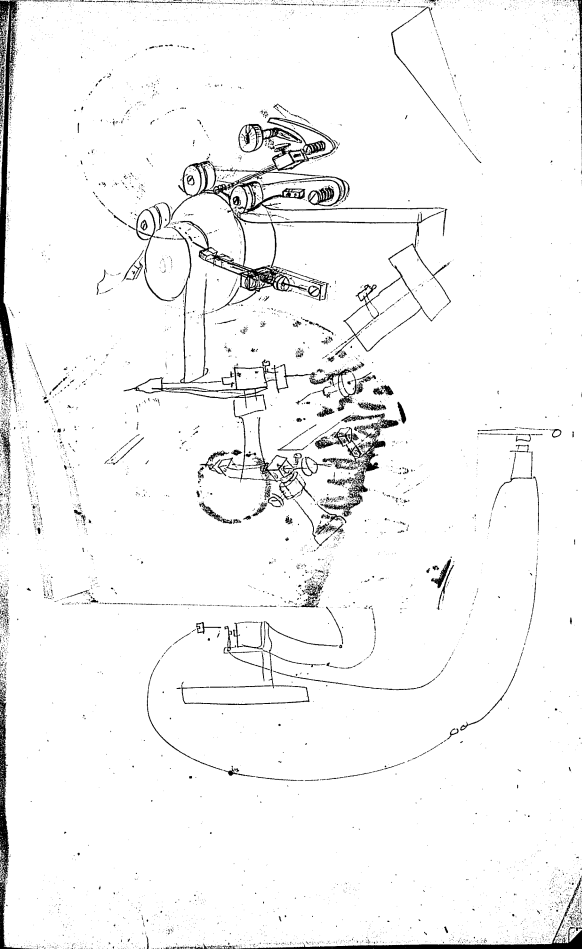
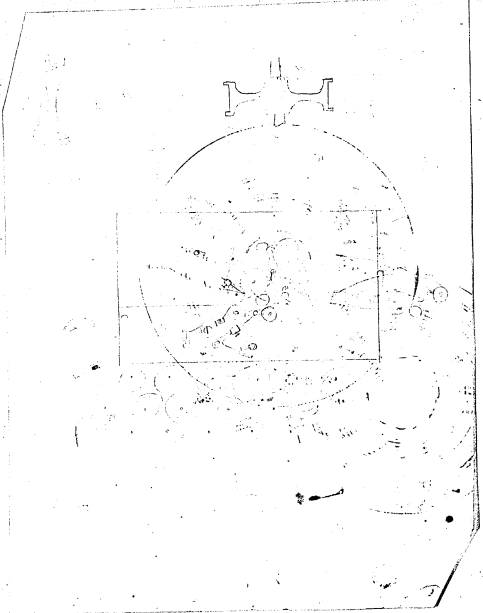
No grooves in drums  
No Brush  
No

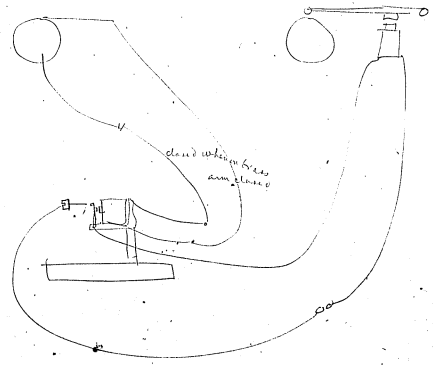
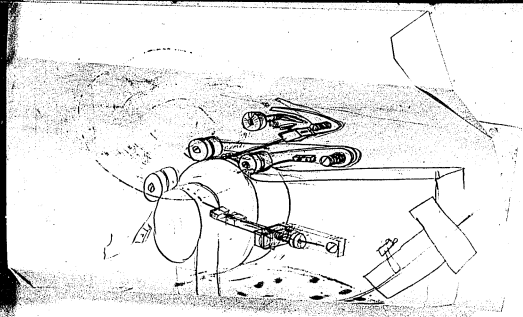
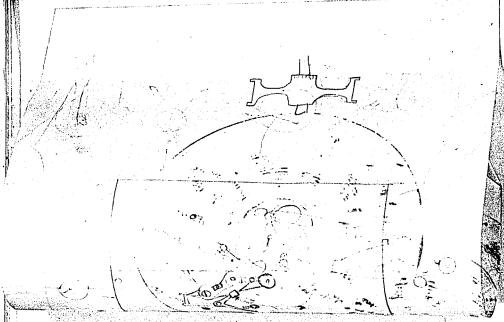


Model for Effluents 2nd 5ff.

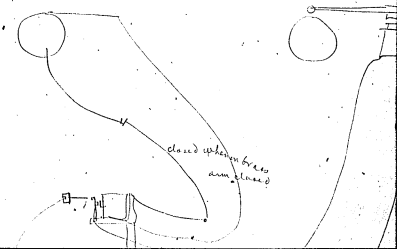
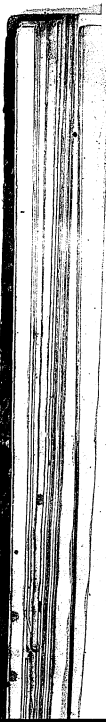
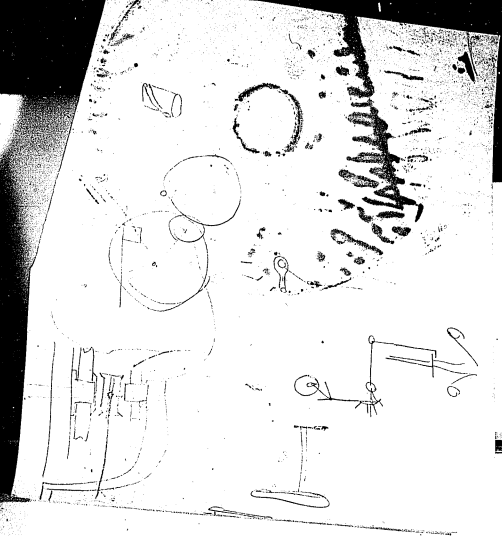
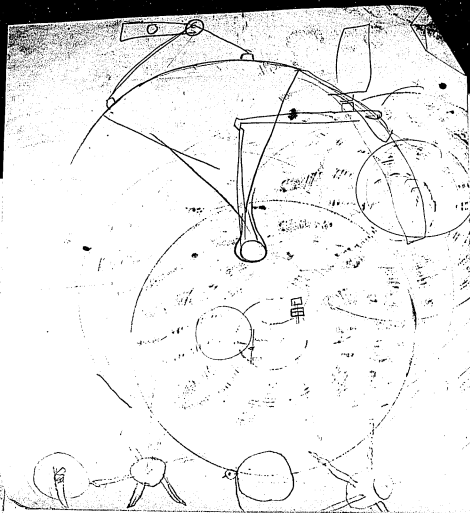


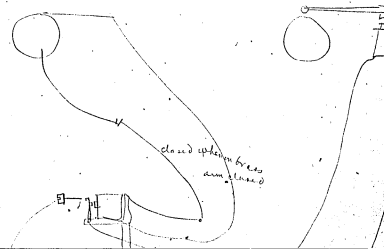
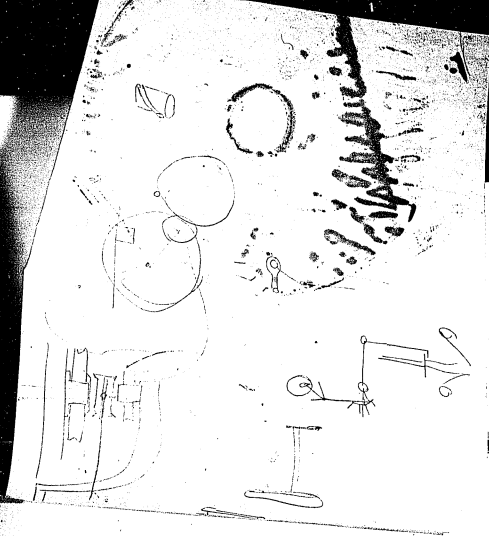
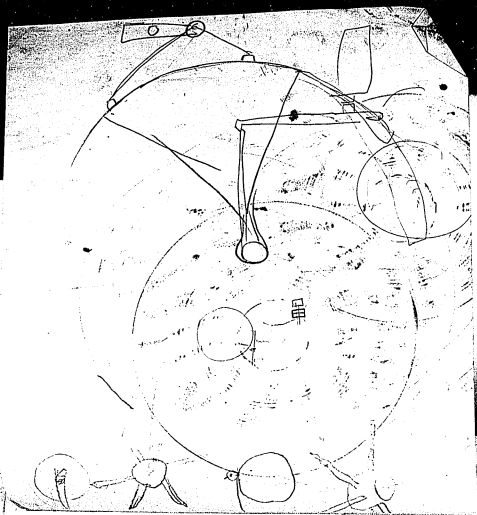
Weight construction

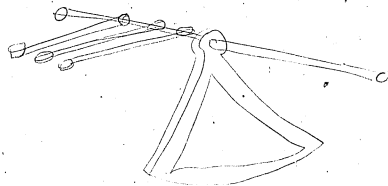












~~4776~~



200  
200

20  
6

25  
6  
750

000

175

EDISON & LINGER

RECORD BOOK

165.66  
165.66  
278  
6

1076  
1110  
2176

107 1/2  
149 1/2  
7.51

1502  
127  
2576

125  
1.00

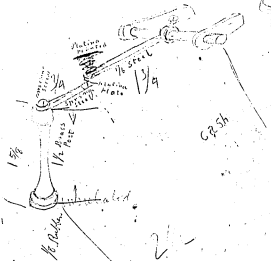
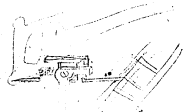
1166  
1262  
287

60 (1800) (182)

48.6

7.51  
12.50  
9.401

126 1/2



120  
1/4



205 6000 2000  
 105 4000 1800  
 53 2000 1500  
 21 2000 1800  
 22 6000 2000  
 17 2000 2000  
 27 1000 2000

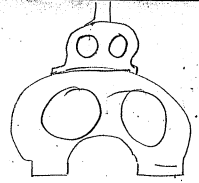
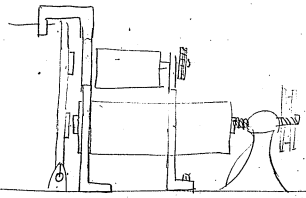
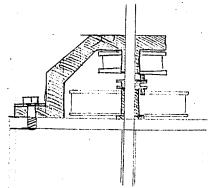
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 105 4000  
 53 2000  
 21 2000  
 22 6000  
 17 2000  
 27 1000

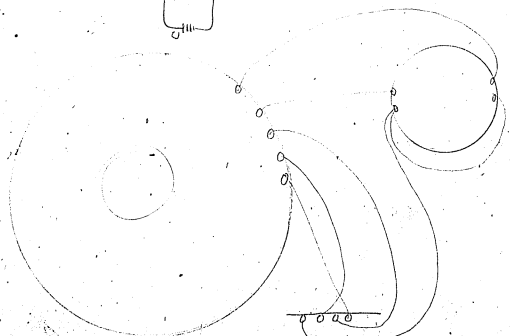
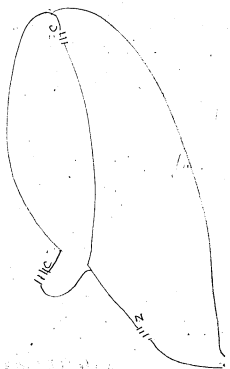
51  
 3000  
 3110

205 6000  
 105 4000  
 53 2000  
 21 2000  
 22 6000  
 17 2000  
 27 1000

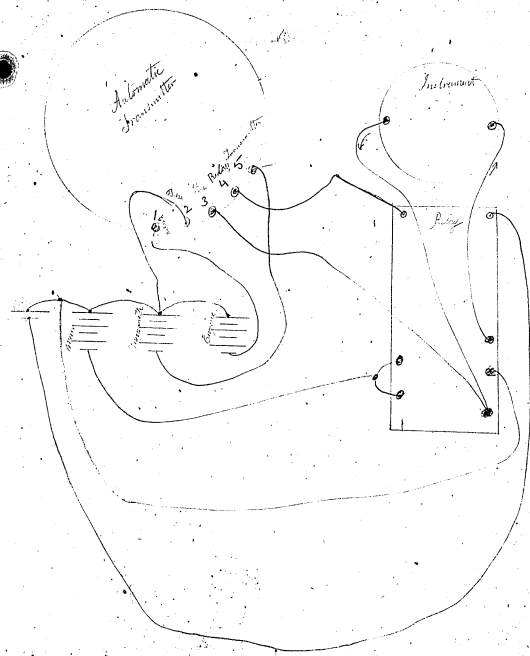
222,800

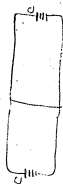
105 600  
 53 200



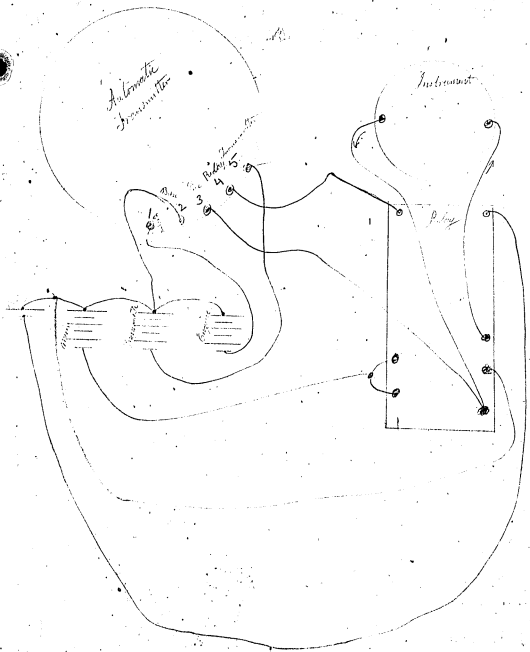
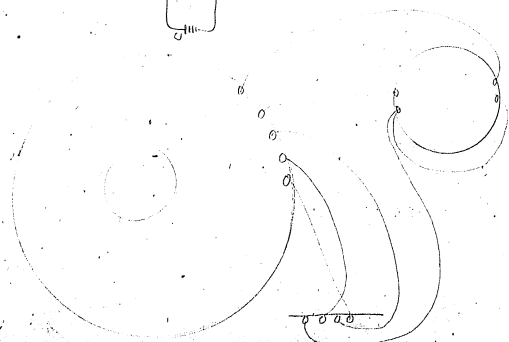


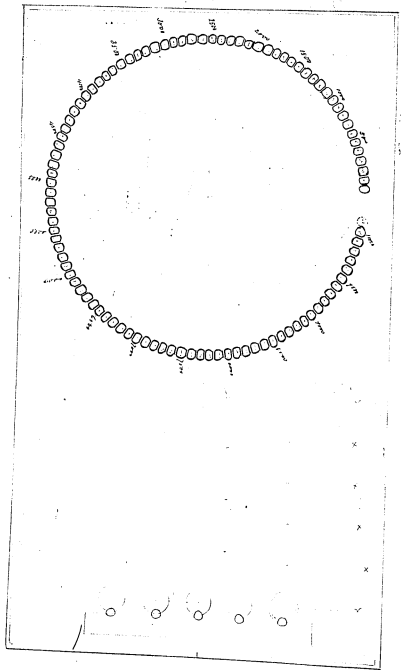
17  
10.5



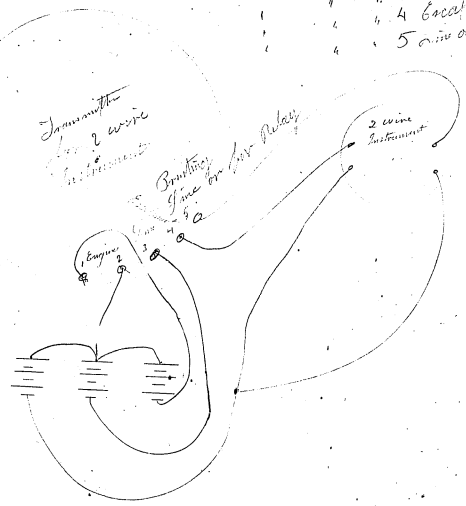


17  
red

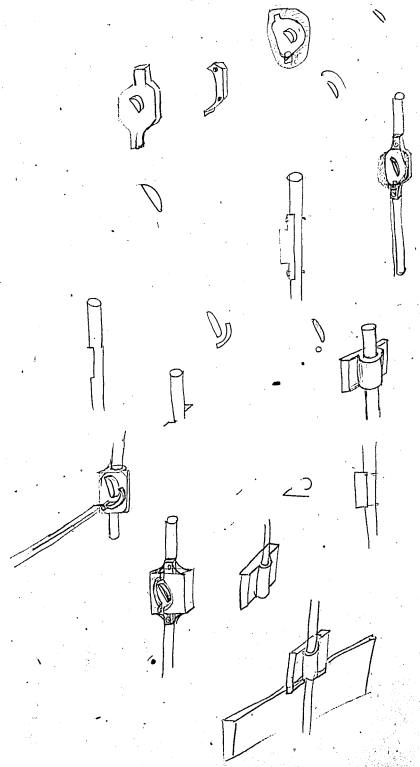
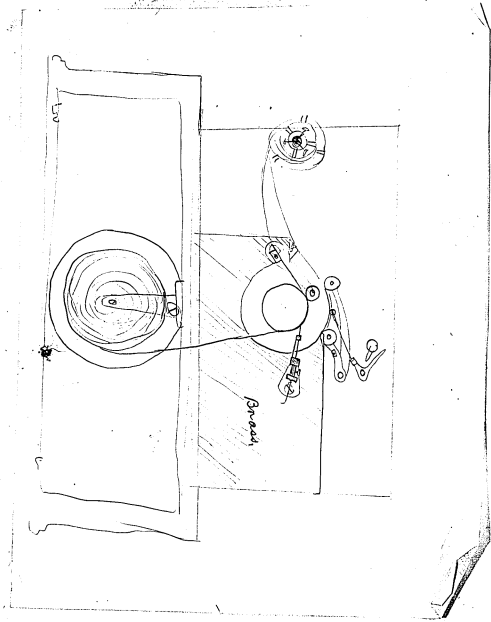


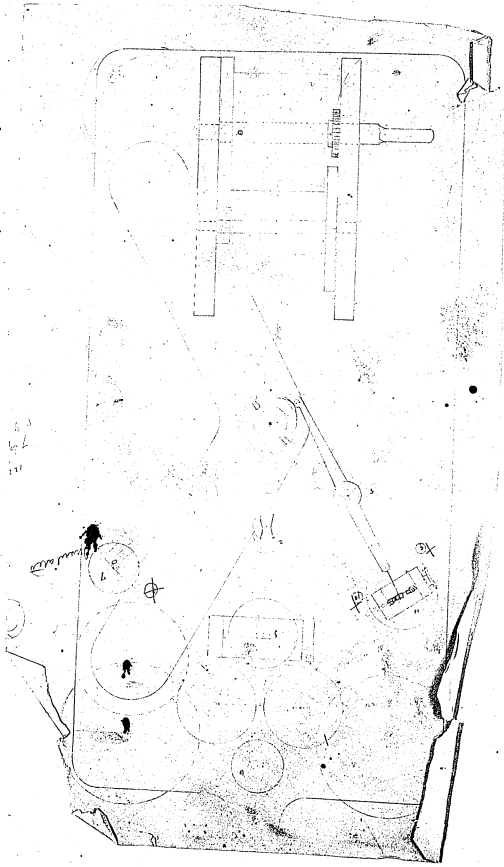


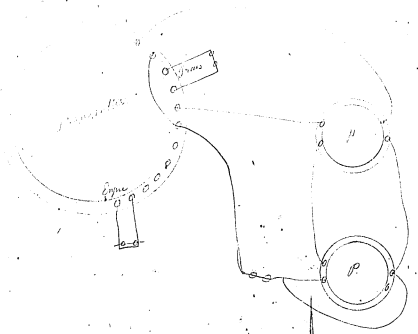
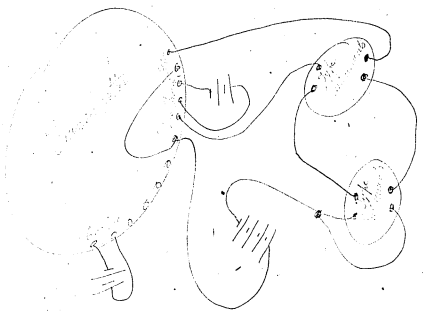
- for Engine
- 2 Base
  - 3 Line
  - 4 Eccalament
  - 5 wire or Ring

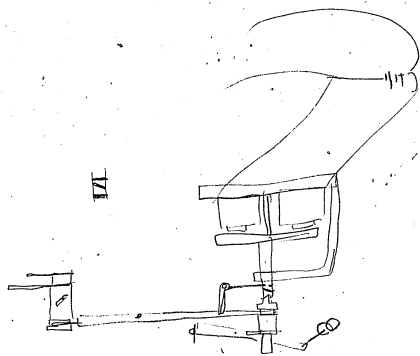
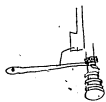
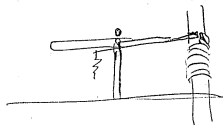




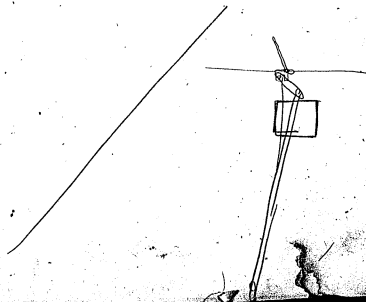


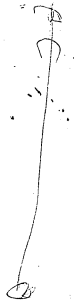




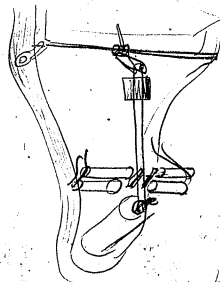
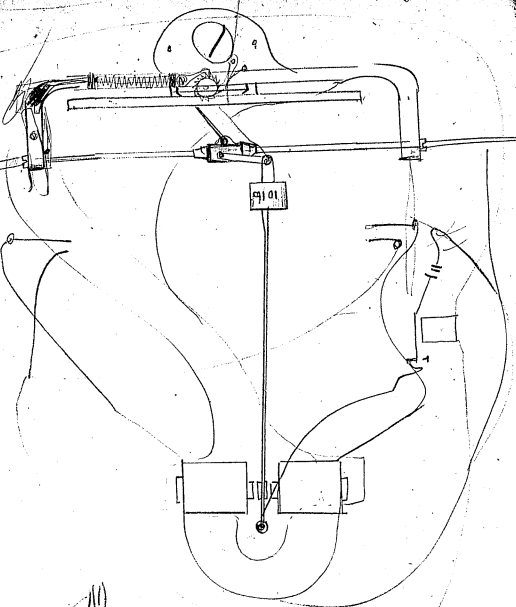


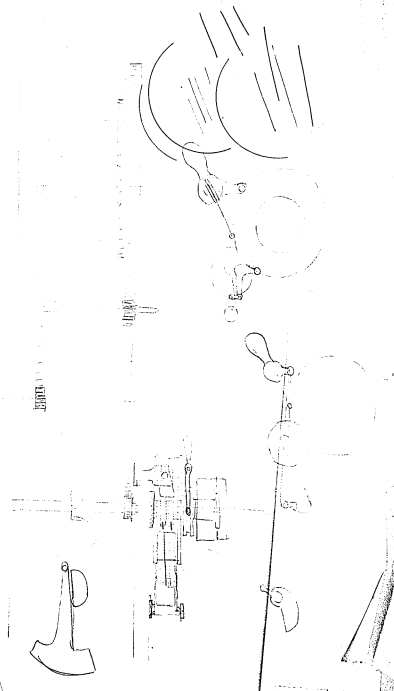
VII





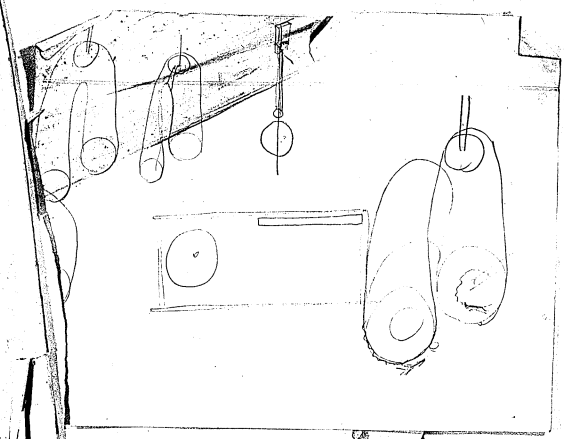
15  
11  
10  
9  
8  
7  
6  
5  
4  
3  
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1



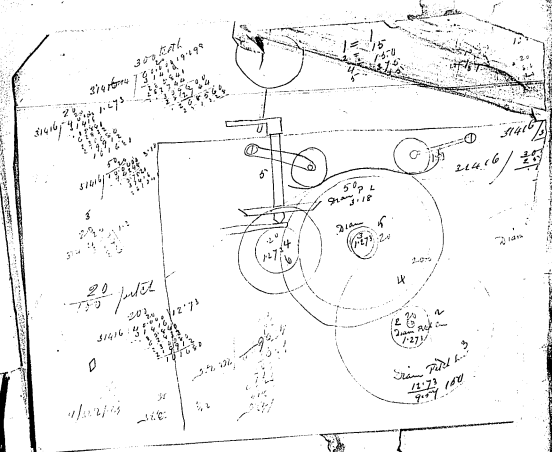
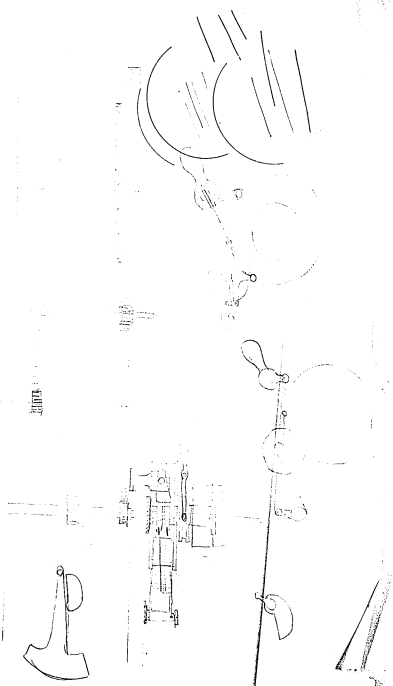


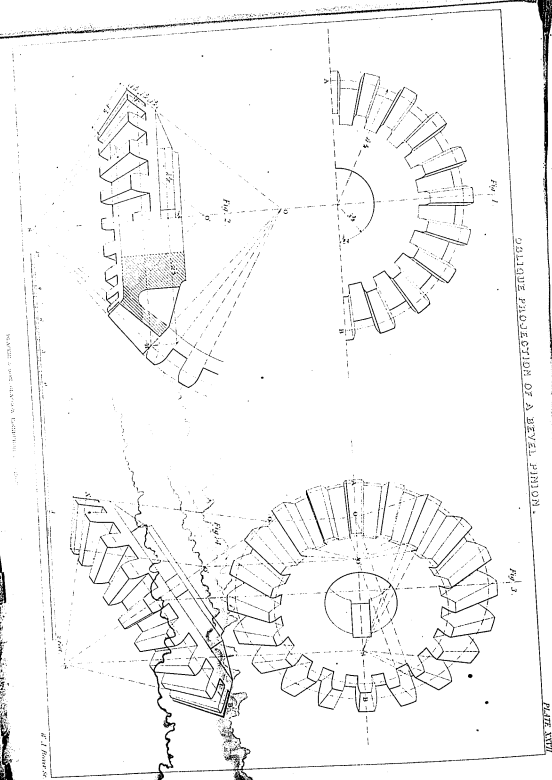
1887

[ITEM FOUND IN BOOK]



[ITEM FOUND IN BOOK]

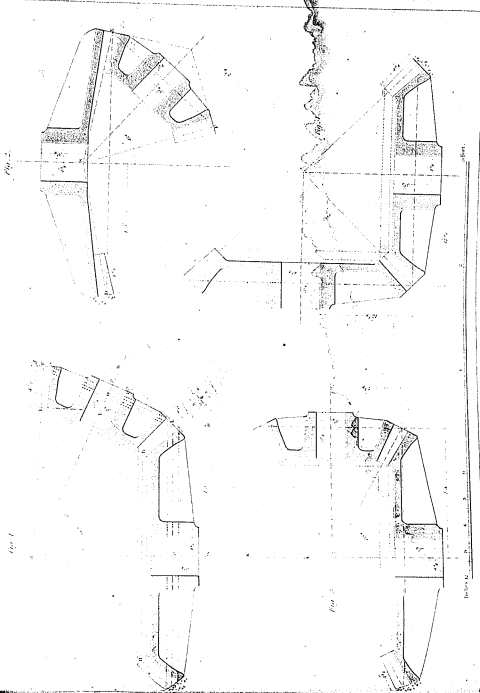






ILLUSTRATIONS OF BEVEL GEARING.

PLATE IV.



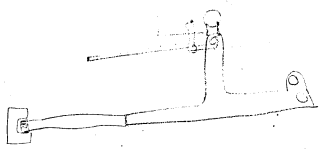
Handwritten notes and diagrams on a separate sheet of paper, including a rectangular box with internal lines and various annotations.

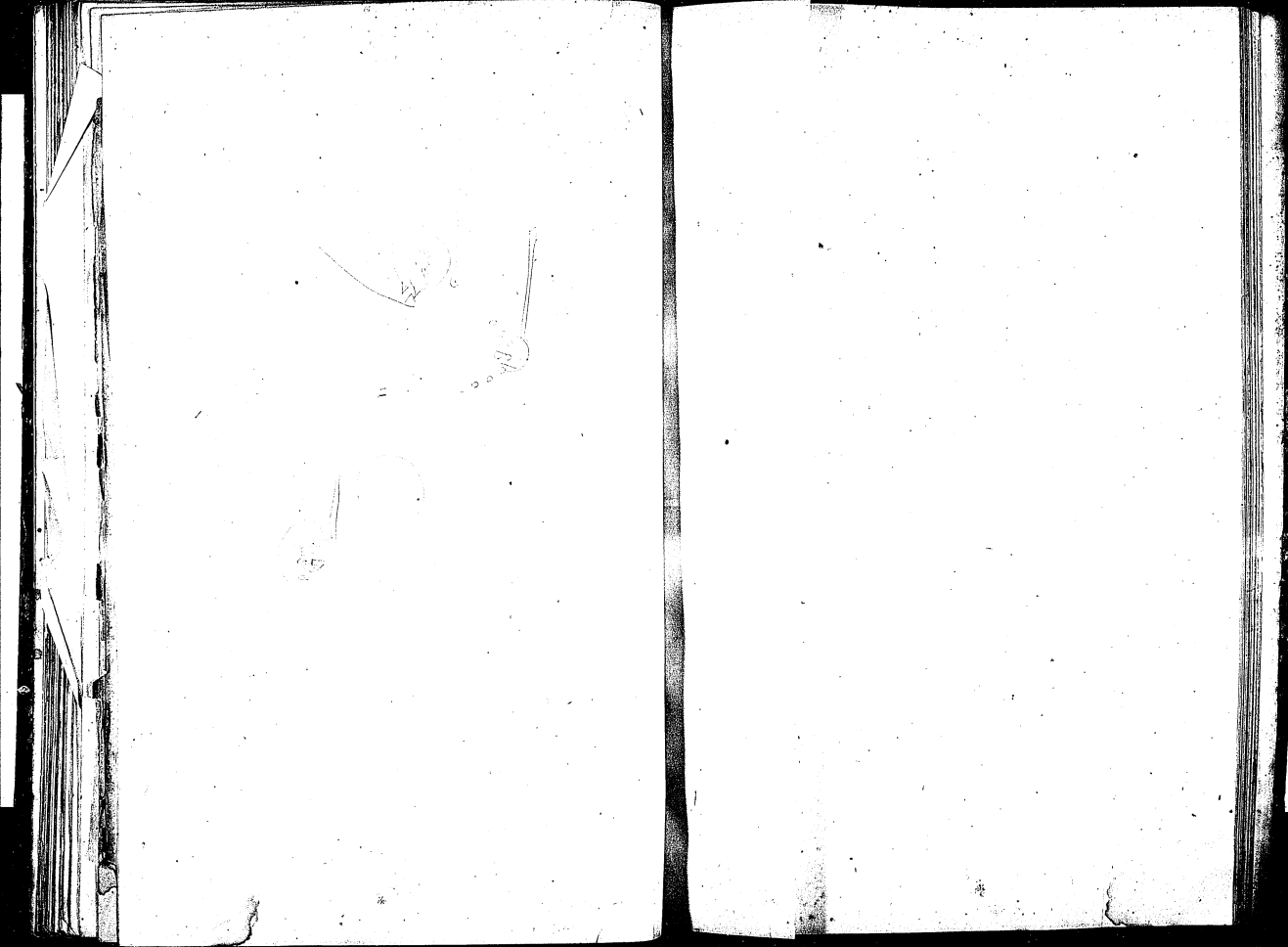
Handwritten notes and diagrams on a separate sheet of paper, including a rectangular box with internal lines and various annotations.

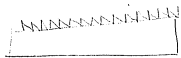


11111

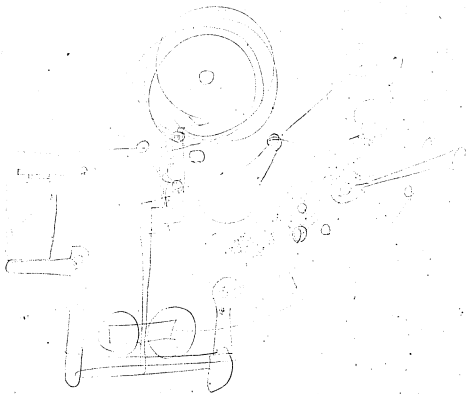
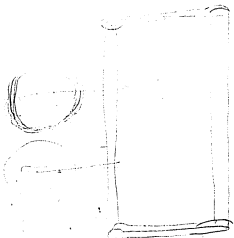
151  
152  
153  
154  
155  
156  
157  
158  
159  
160



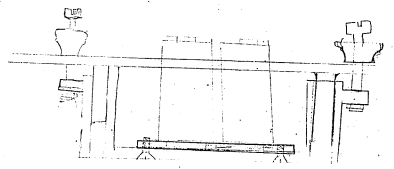
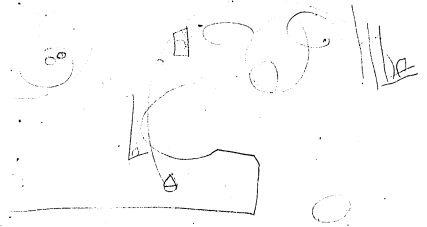
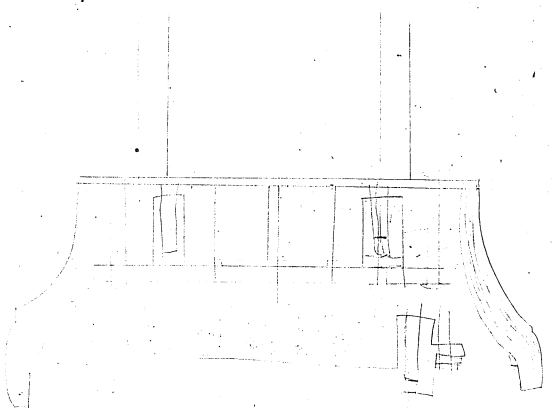


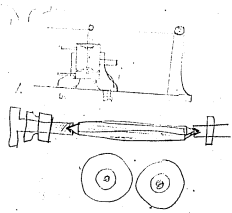
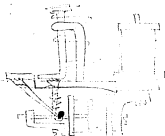
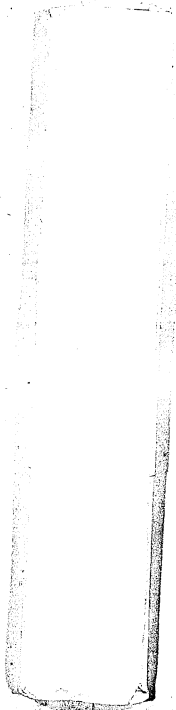


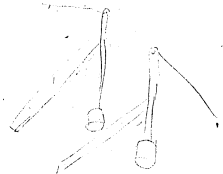
ast



41  
11  
2400

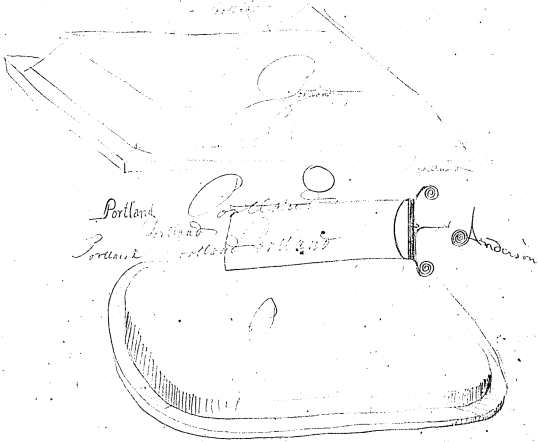
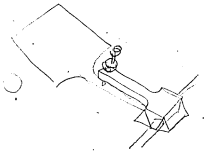
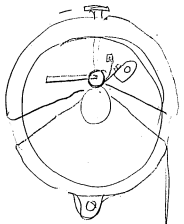




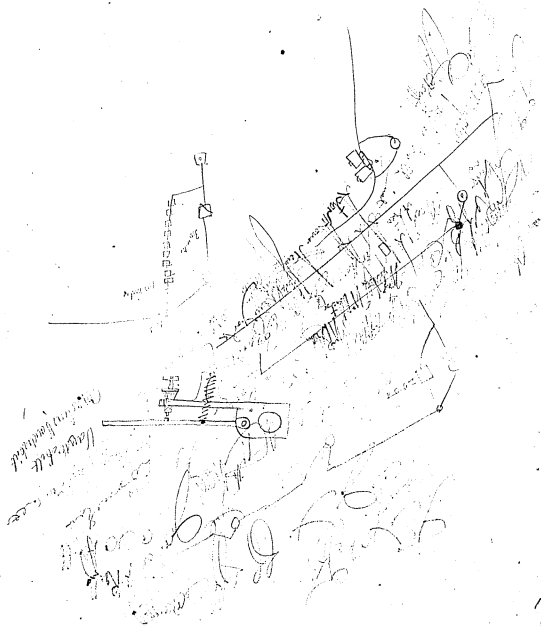


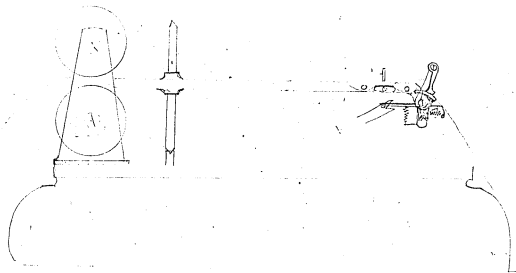
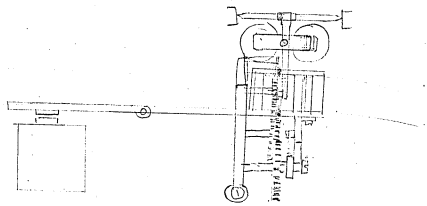
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Portland  
Portland









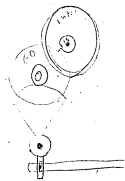
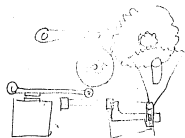
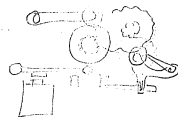
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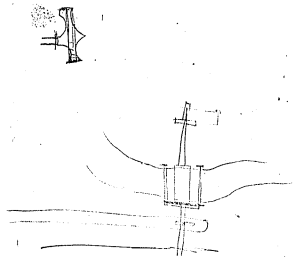
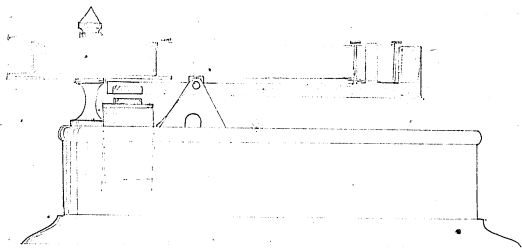


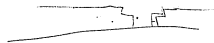
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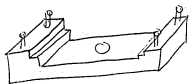
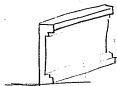
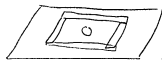
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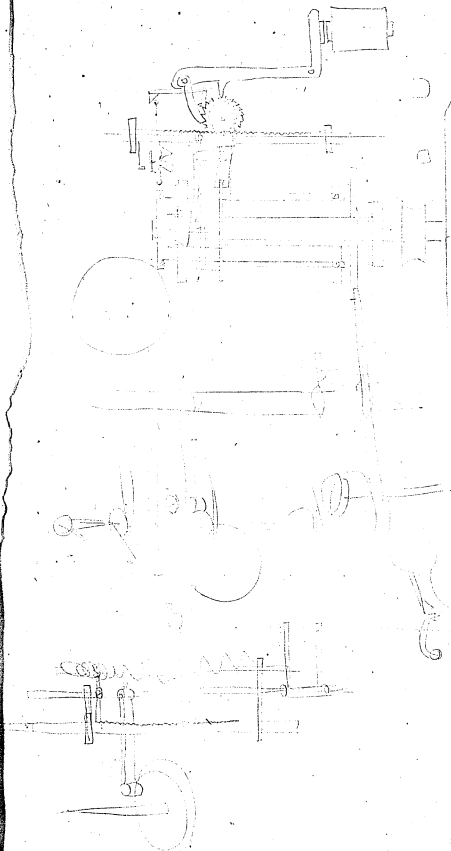
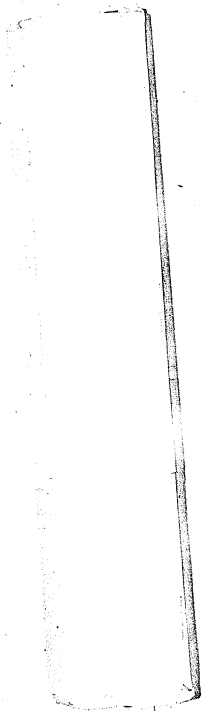


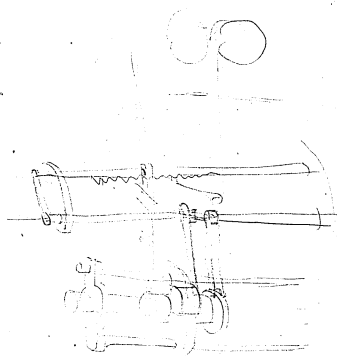
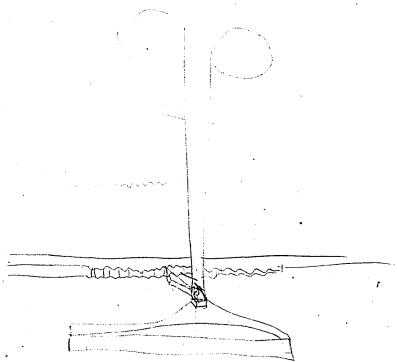


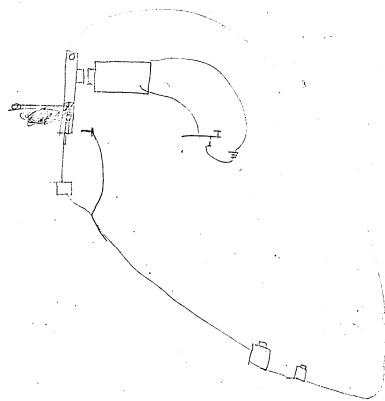


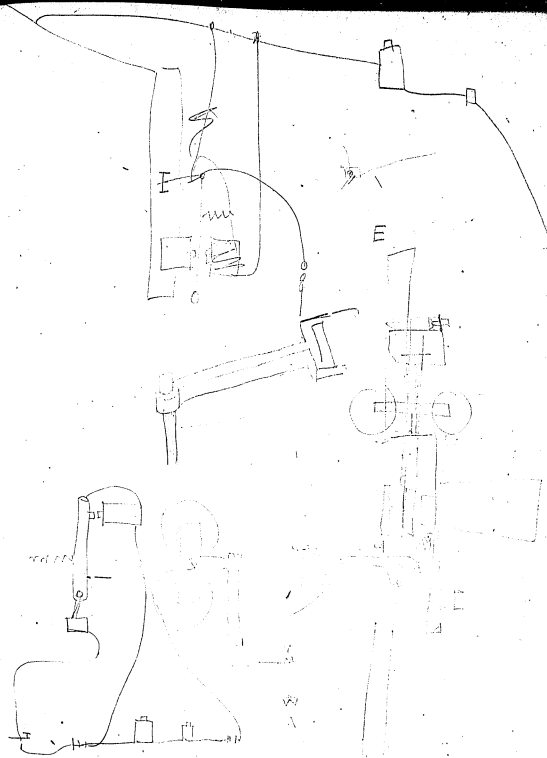
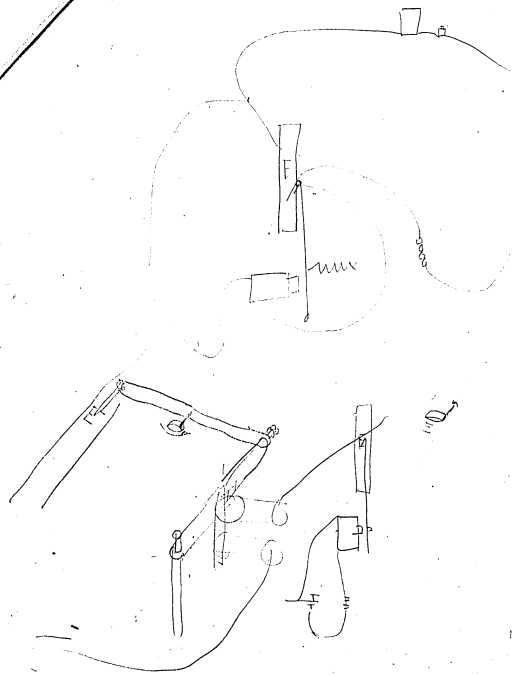
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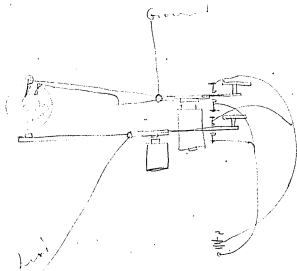
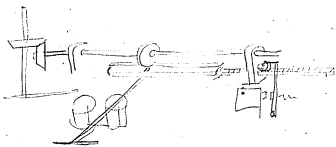






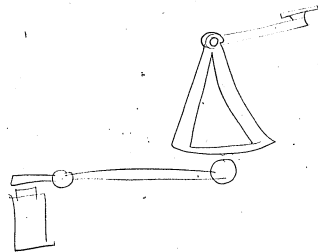
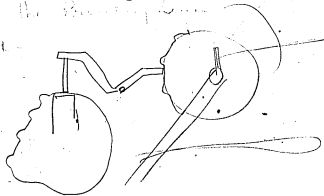


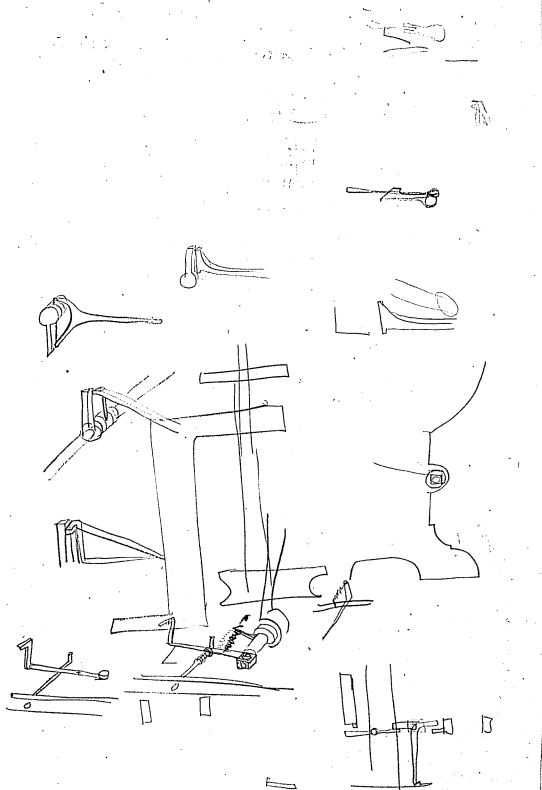
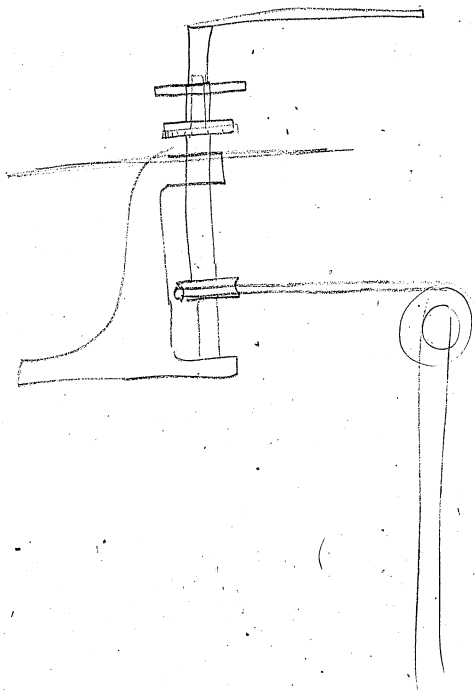


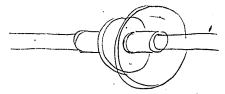
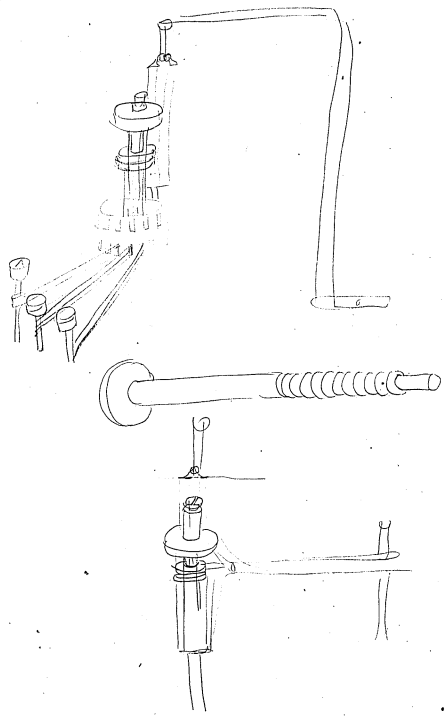


Receiver Telegraph

where the keys are the receiving lines  
 & the ground line







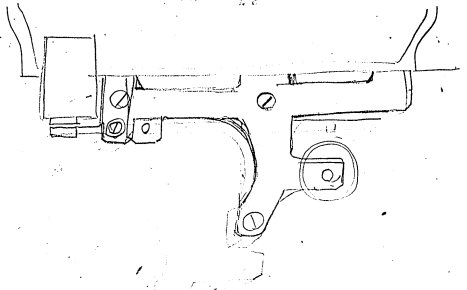
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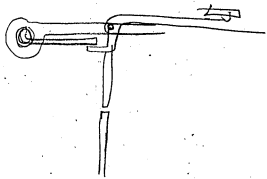
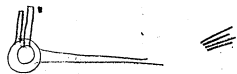
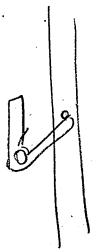
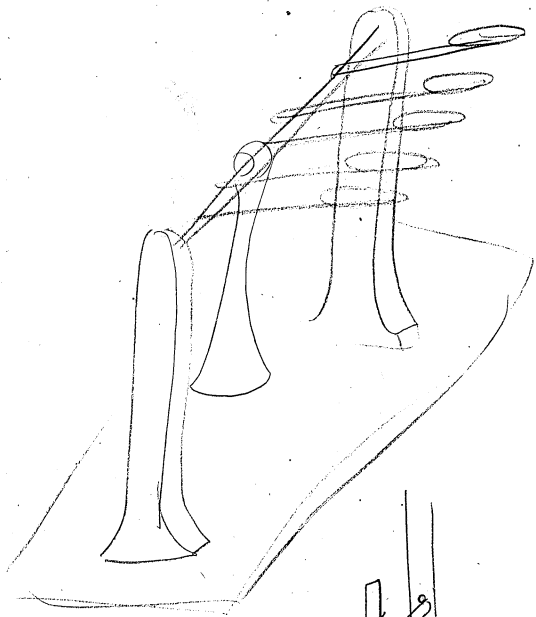
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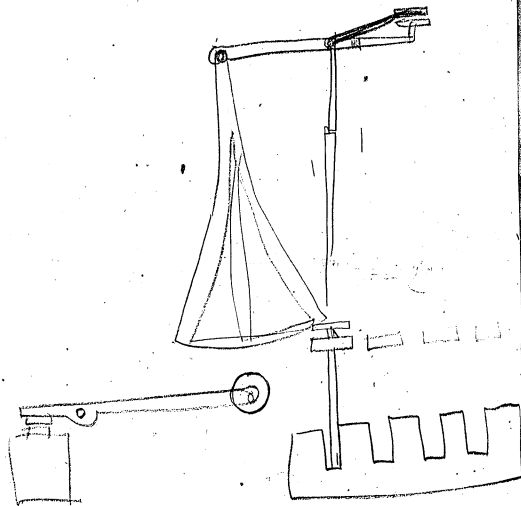
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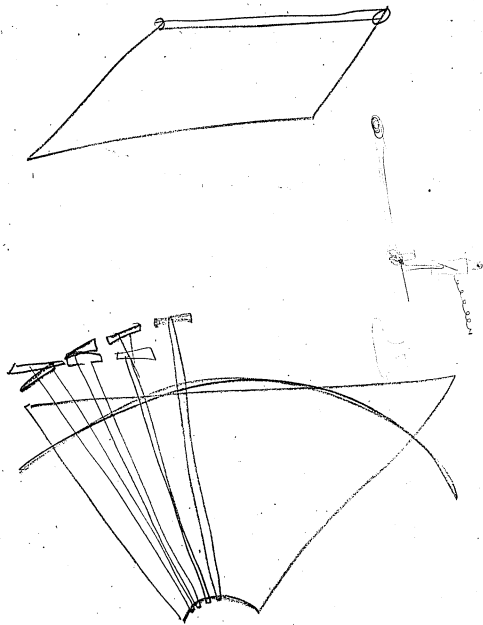


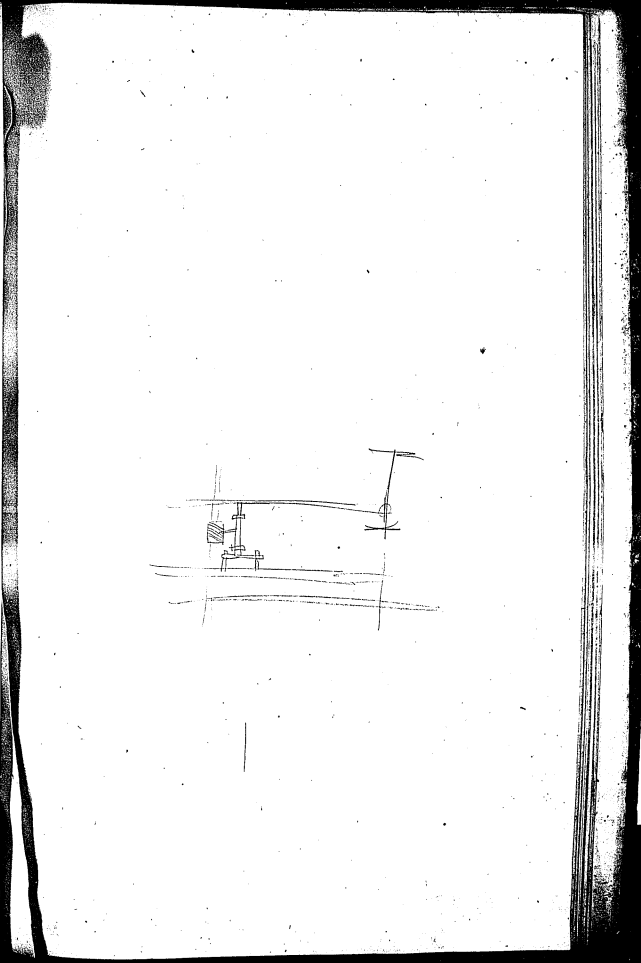
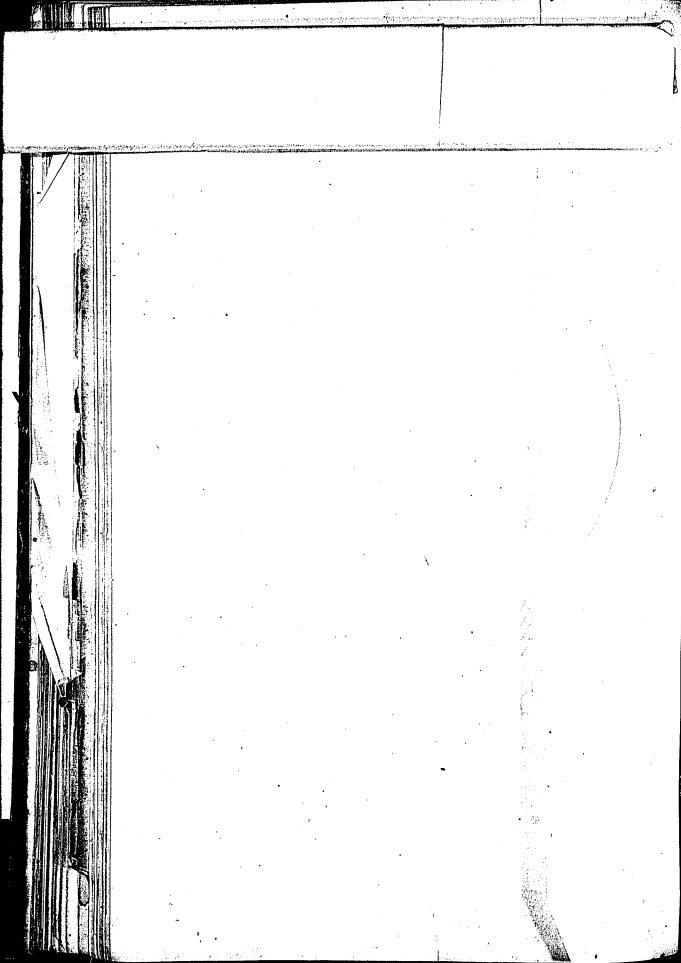
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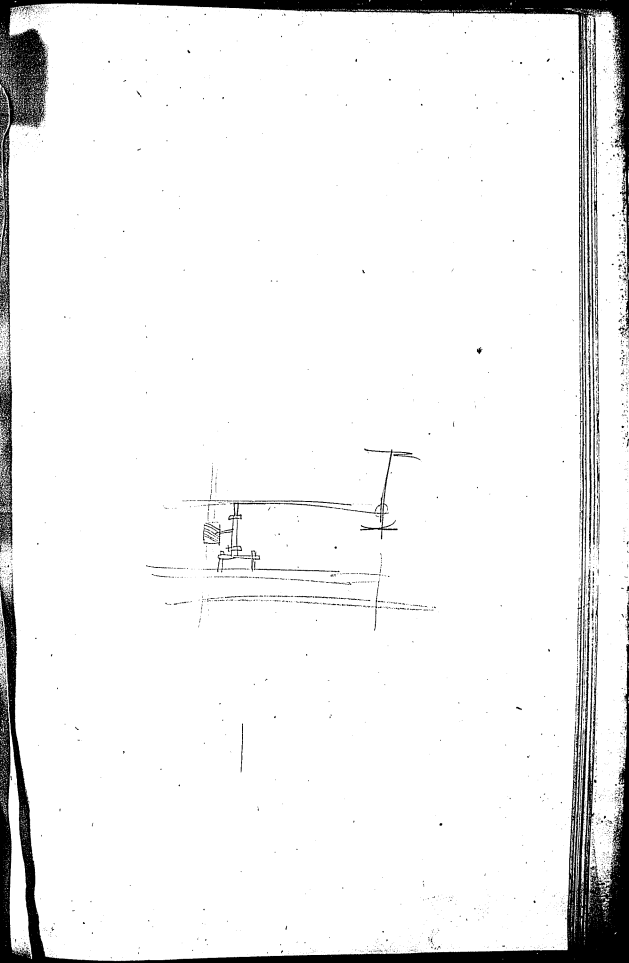
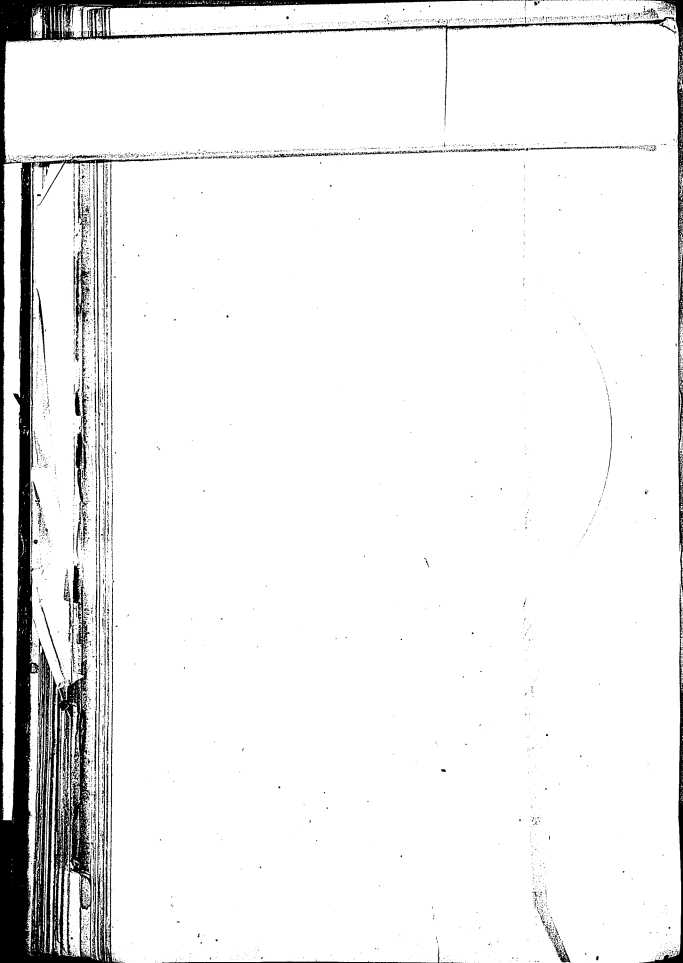




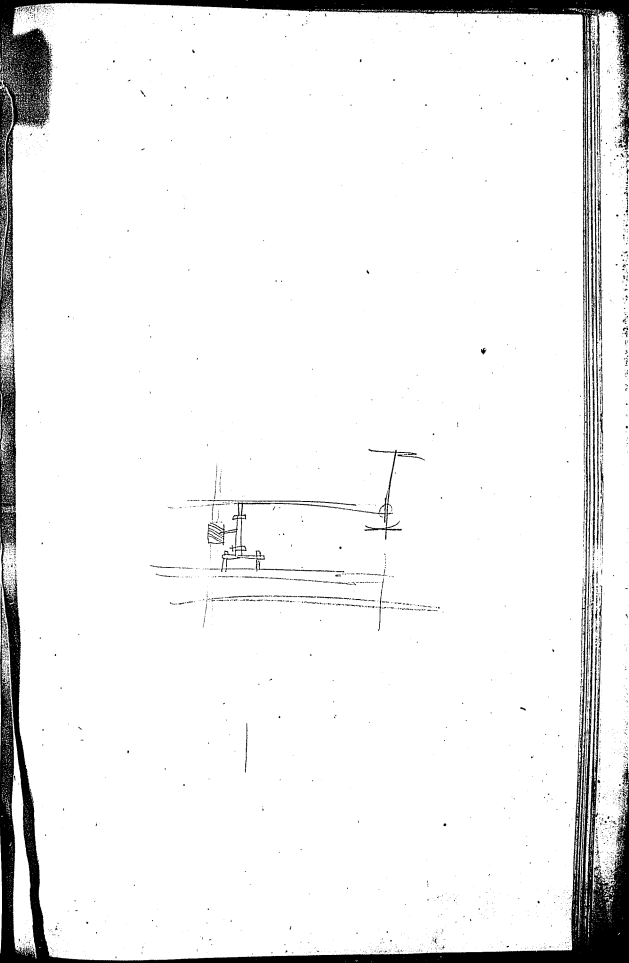
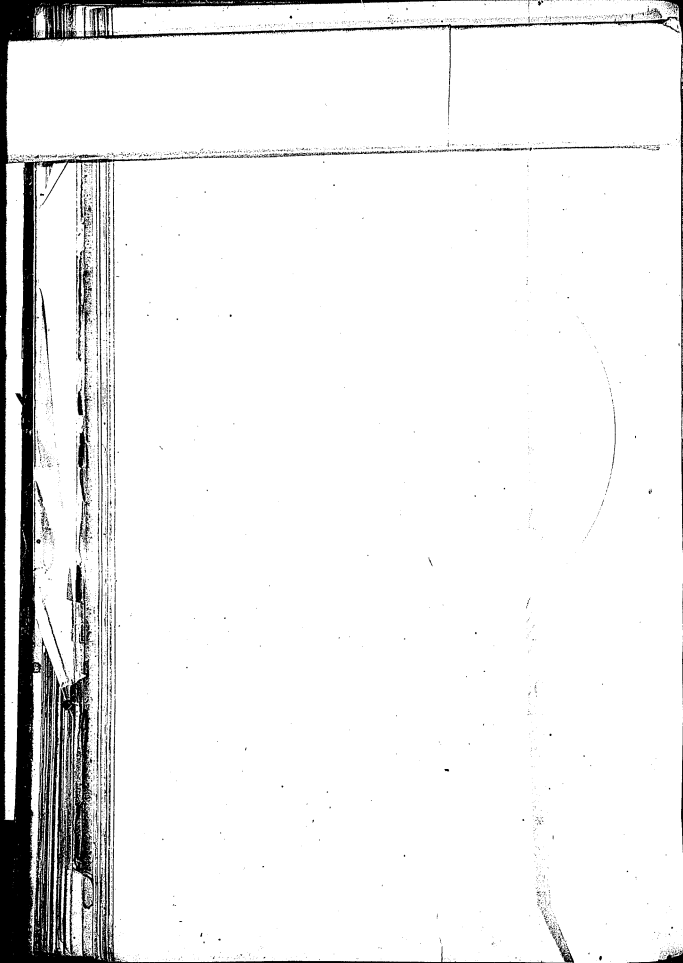
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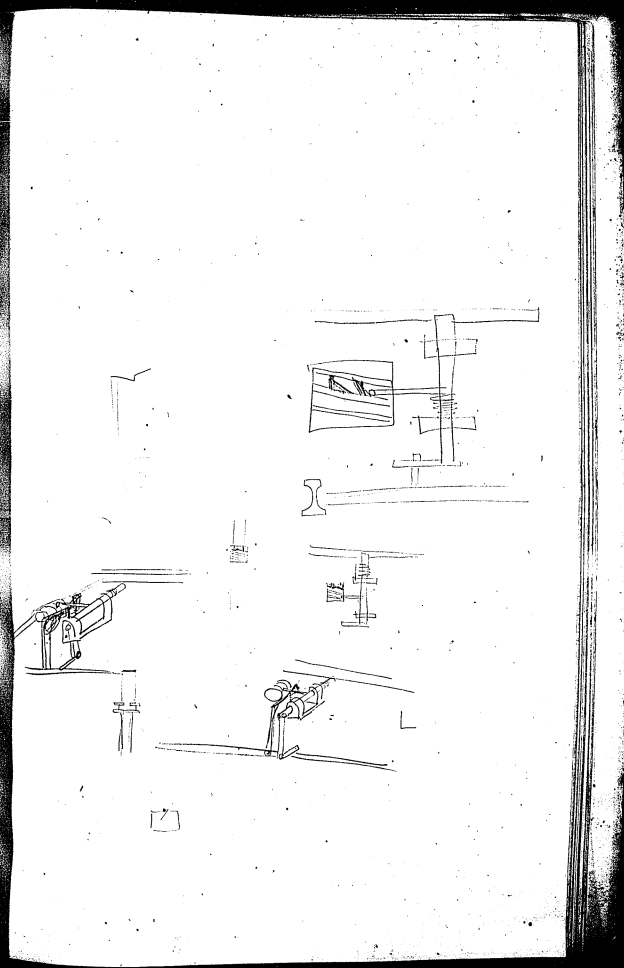
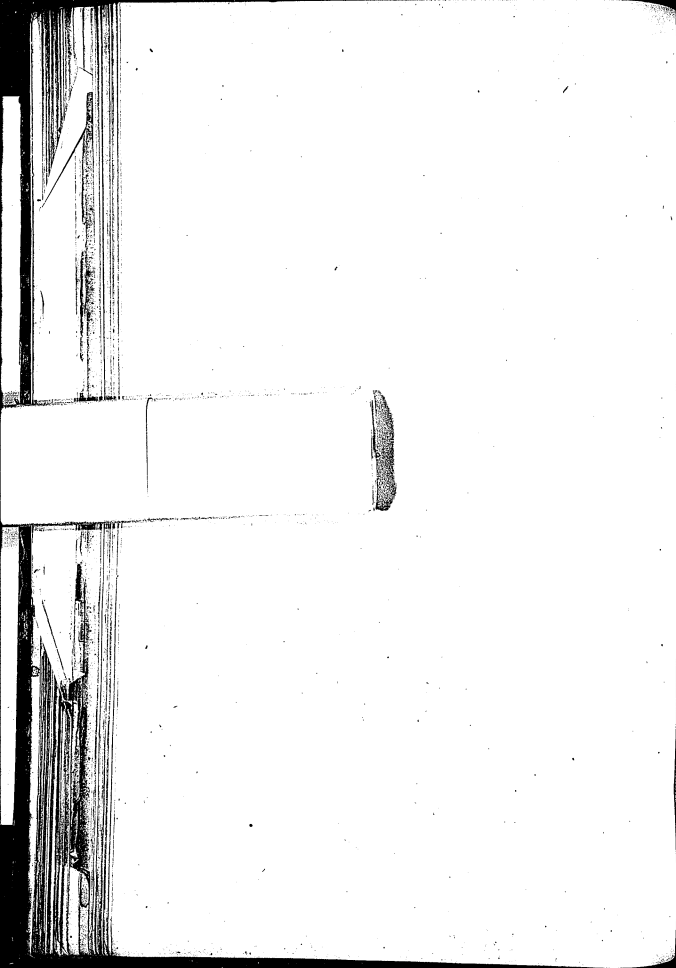


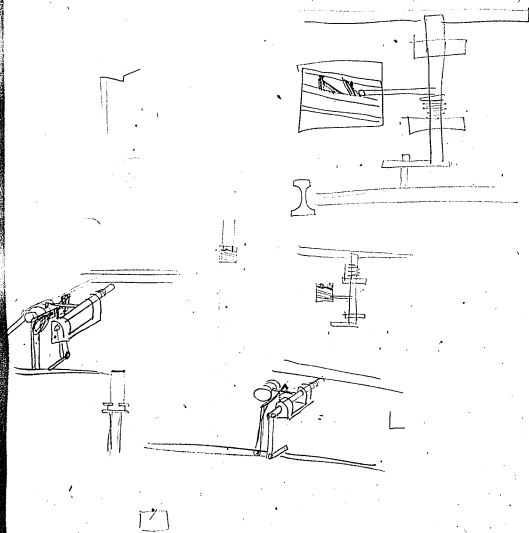


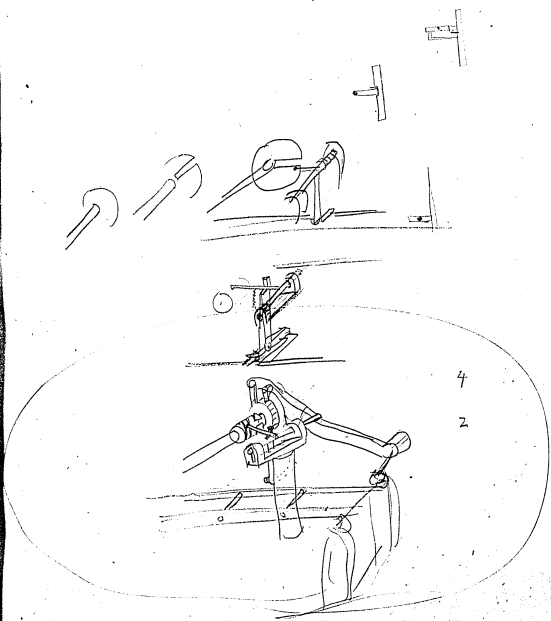


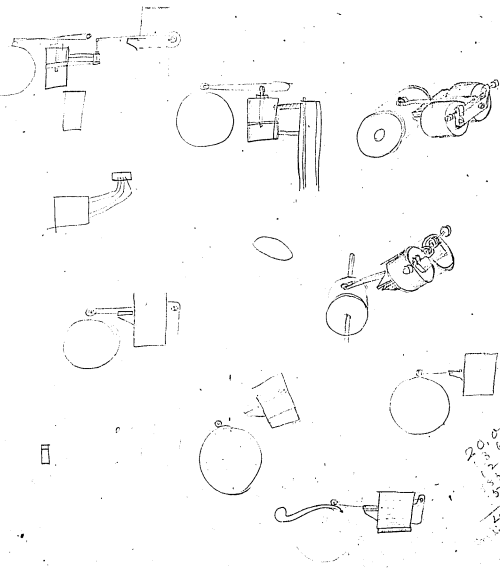




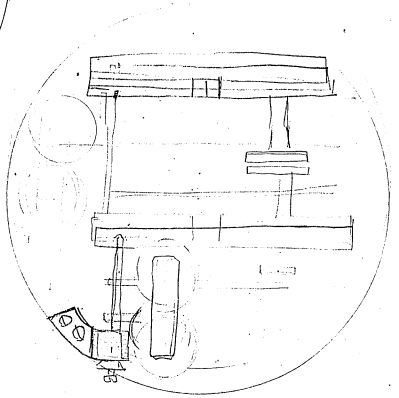
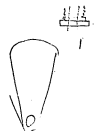
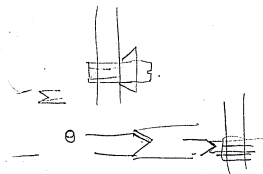




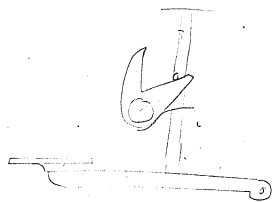
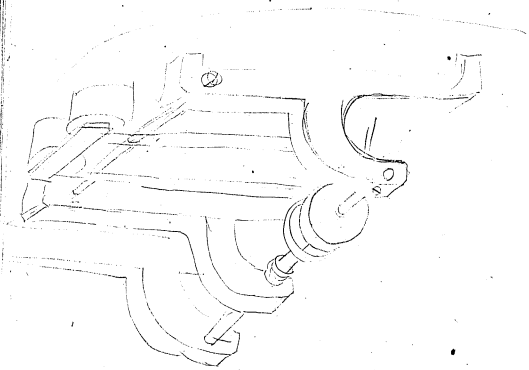




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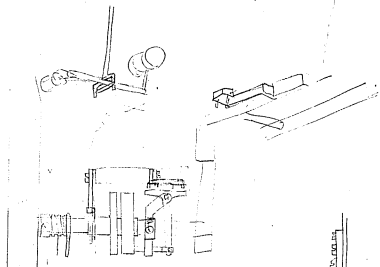


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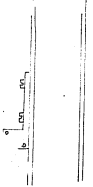




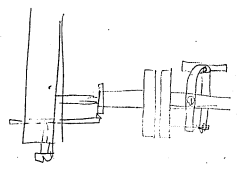
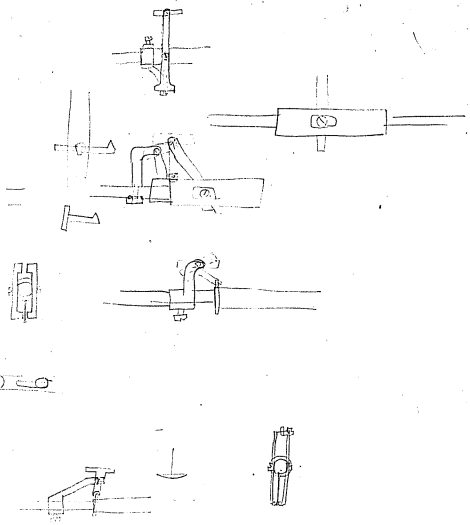
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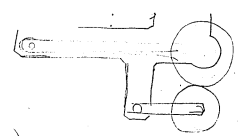
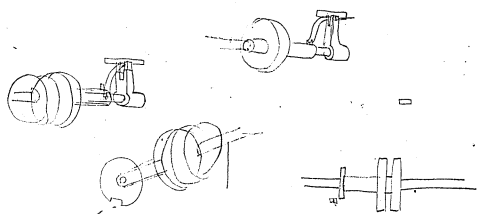


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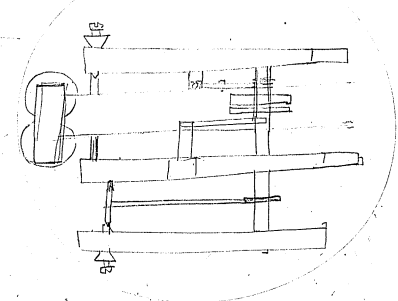


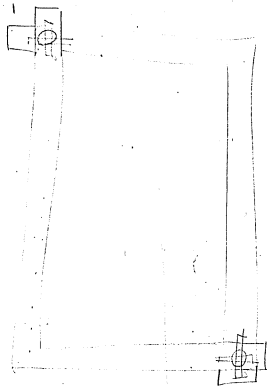
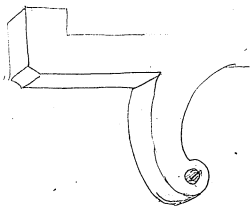
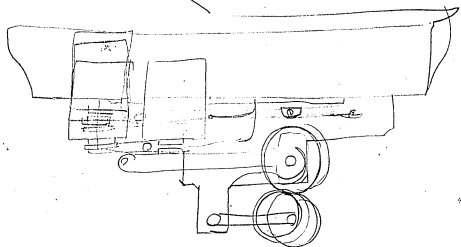
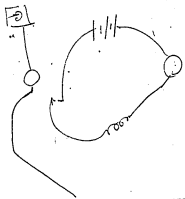


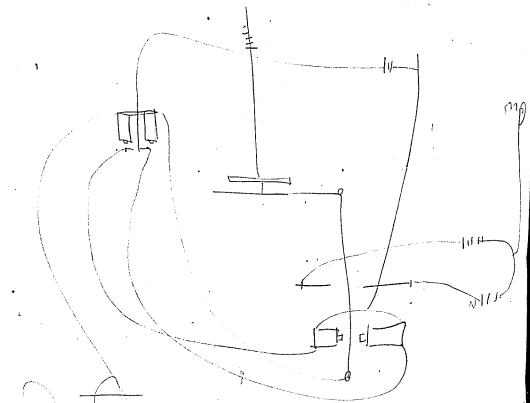


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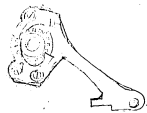
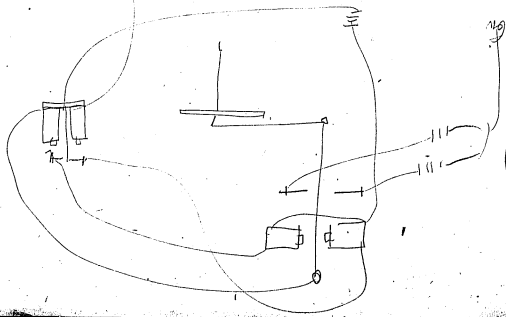
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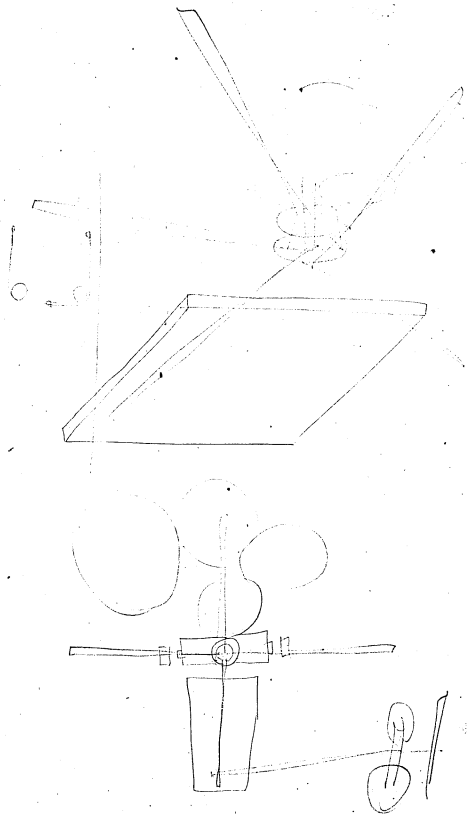
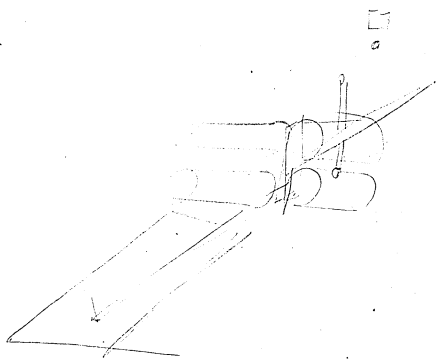




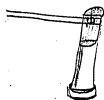
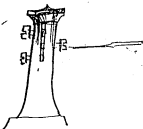
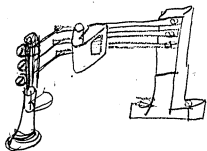
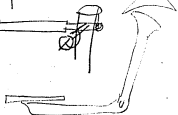
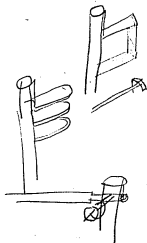
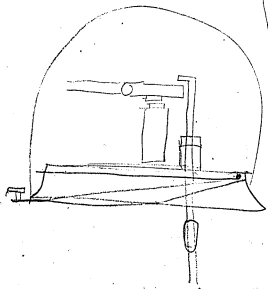
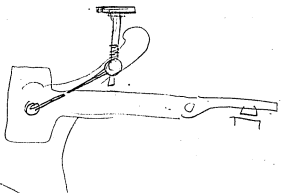
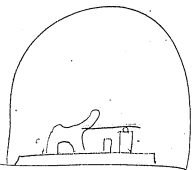


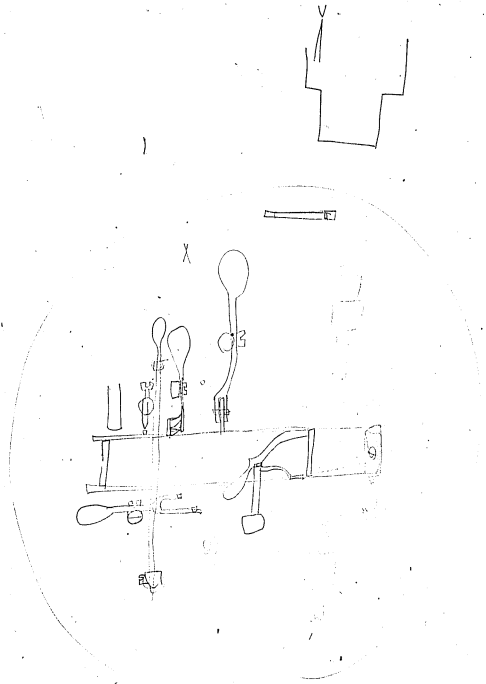
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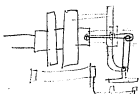
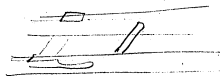




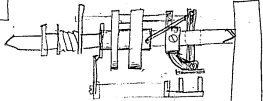




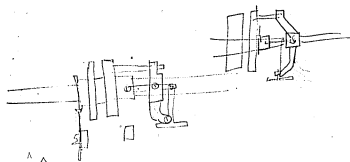
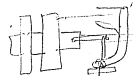




1. N.Y. 1934



Effort: 1000 lbs



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919  
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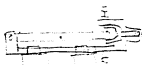
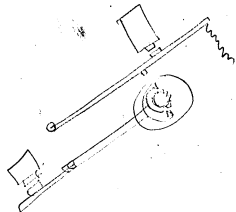
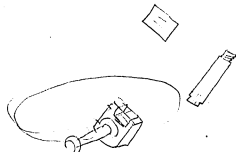
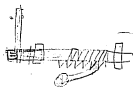
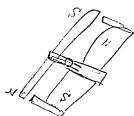


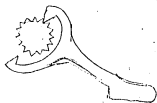
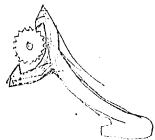
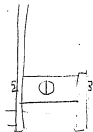
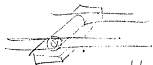
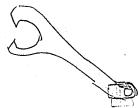
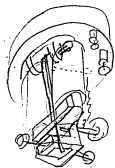
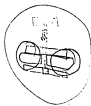
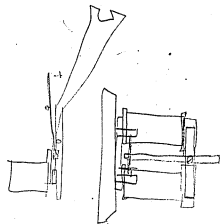
Fig. 10



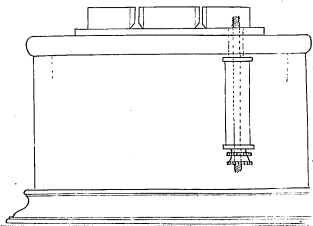
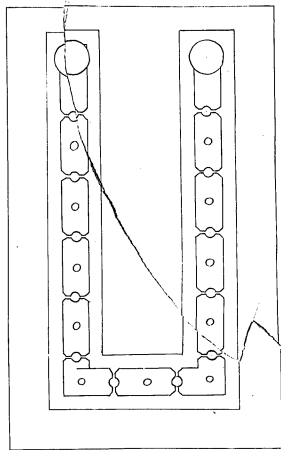
Fig. 11

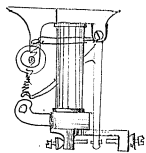


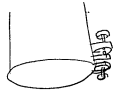
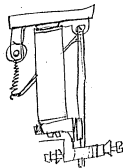
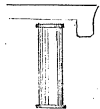




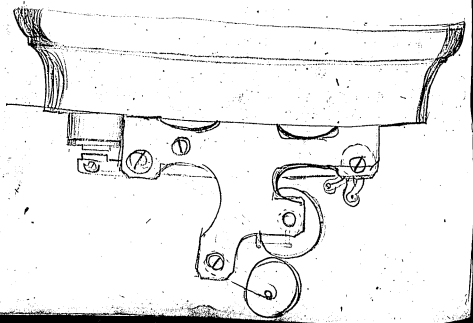
Nov 6. 1774  
12. Steel Resistance to Fire

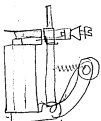
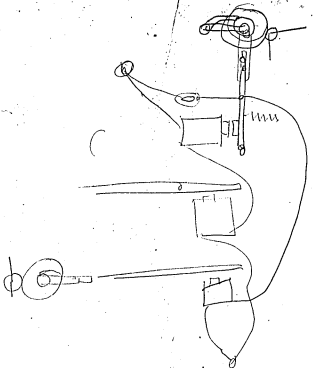
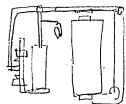


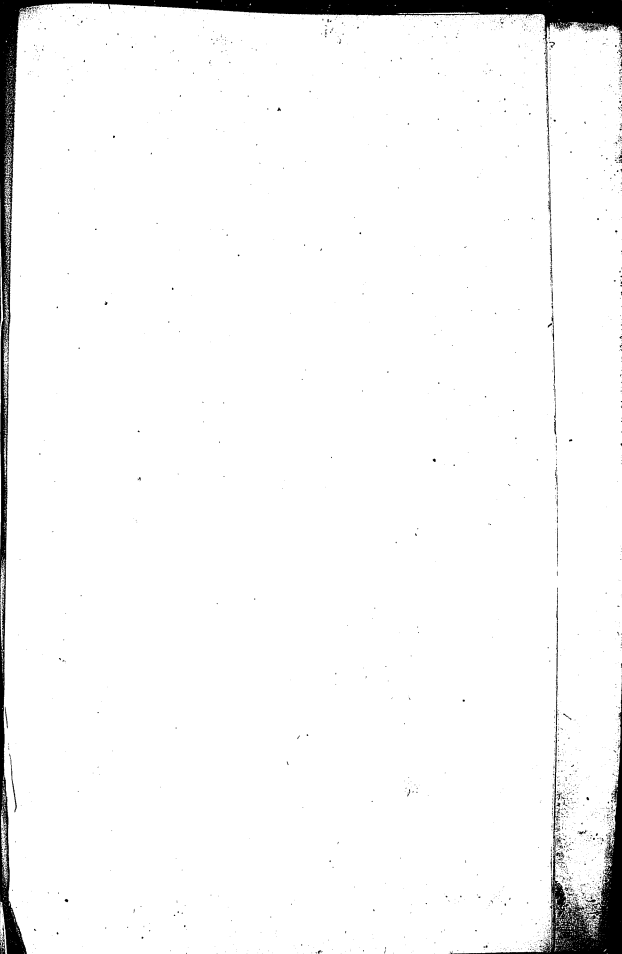
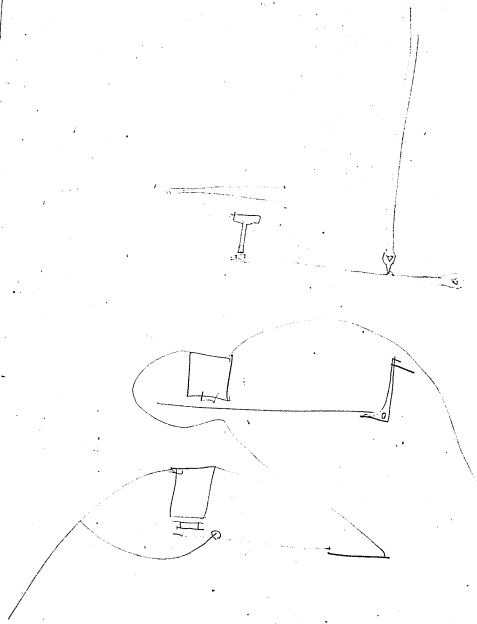


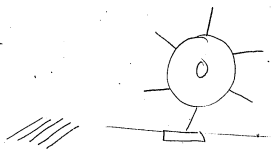




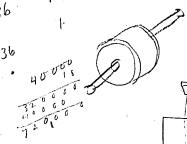




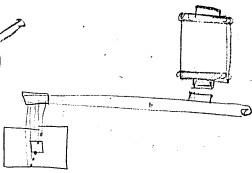




36  
18 wires  
36  
110  
36  
550  
330  
5960



40000  
11  
10000  
10000  
70000



32  
36  
192  
96  
142

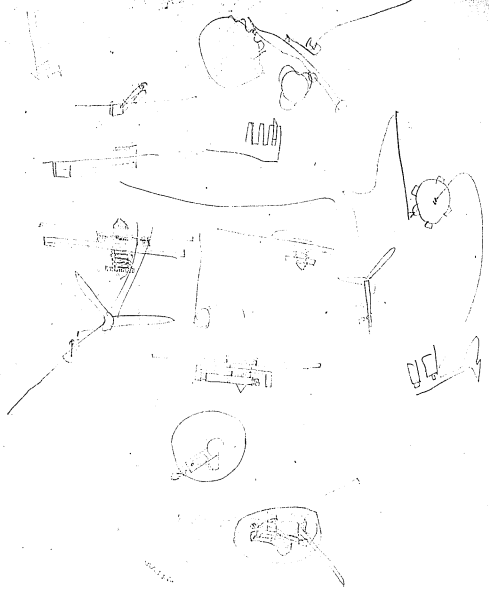
1600  
6  
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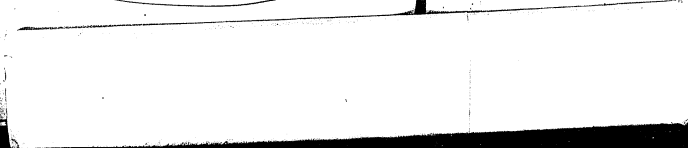
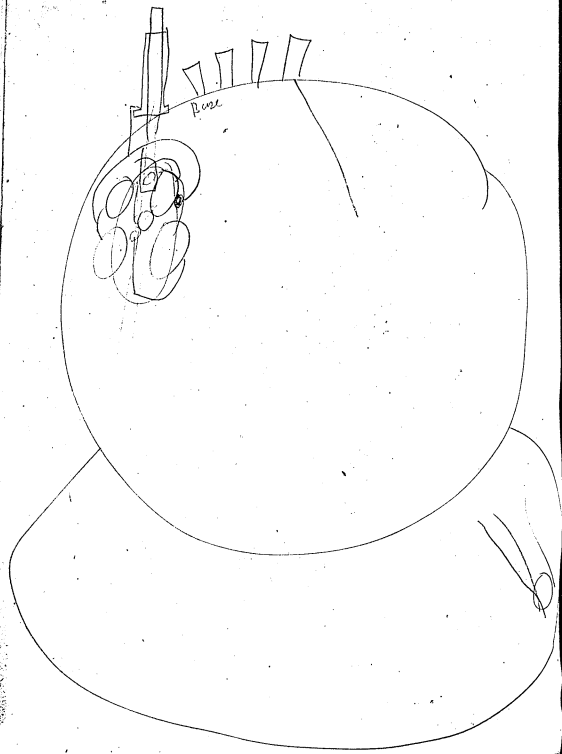


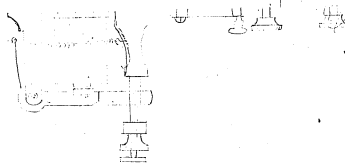
30  
35  
700  
40000  
21000

20











Laboratory Scrapbook, Cat. 297

This scrapbook contains only a few dated entries, covering the period December 1871-November 1875. Most of the notes and drawings are by Edison and relate to various aspects of telegraphy, including the multiplex, automatic, chemical, and domestic telegraph. There are also drafts of Edison's caveats and patent applications, as well as descriptions of telegraph-related patents by other inventors. Some of the pages are part of the series of draft essays found in NS-74-002, Unbound Notes and Drawings. The book also contains drafts of letters and essays published in The Operator and The Telegraphic Journal. Other documents include correspondence with George Barker, George Gouraud, and others; accounts, essays, and memoranda; and an issue of Telegraphica, dated June 10, 1873. The cover is marked "R."

The book contains 310 numbered pages. It has been disbound, and most items have been removed from their scrapbook pages to allow for filming. The scrapbook page number has been filmed below each document.

Blank pages not filmed: 39-40, 49-50, 109-110, 141-142, 155-309.

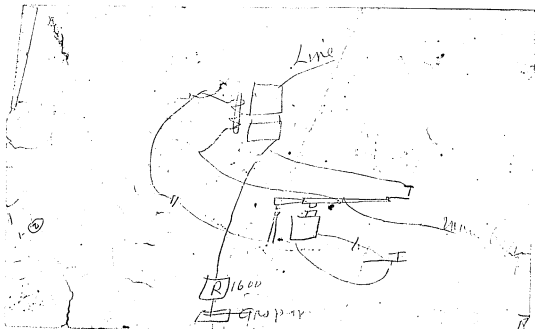
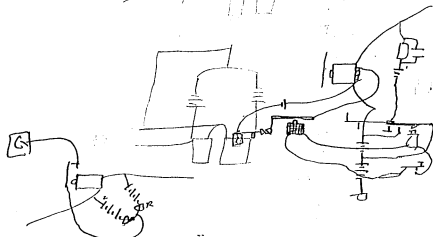
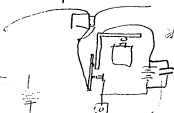
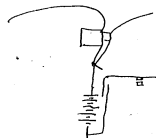
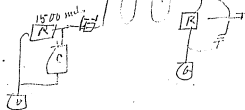
[ITEM FOUND IN BOOK]

Feb 15	15 Stones & prongs	1	
	17 Grind Stone	1	78
1915	Security for Gas	1	10.00
21	1 turning chisel	1	30
27	1 Gauge	1	35
	1 Chaser	1	55
7	6 1/2 oz steel	1	02
	1 Saw	1	25
28	1 lb anti-mo...	1	28
28	3 ft rubber tubing	1	4
28	1 Glue pot	1	5
28	1 Rule	1	
28	1 Bar tin	1	
28	1 Dusting brush	1	
219	1 Carpenter Bill	1	
Y. 19	11 face plate		
Mar 1	116 1/2 lbs.		
7-2	Chemical		
2-2	paper		
Feb 21	2 w.		
27	1 P.		

[ITEM FOUND IN BOOK]

	Wetthe clo	2.95	00
	Prasses Bill	95	00
Feb 21	2 1 gallon Cans	90	
	1 qt Alcohol	75	
	" Sperm oil	75	
	" 2 lbs pumice stone	14	
	" 1/2 " Shellac	35	
	" 1 Match box	25	
	" 12 sheets "O" Emery paper	30	
	" 12 1/2 cloth do	80	
	" 12 sand paper	18	
	" 1 Lacquer brush	20	
	" 1 ball wick	10	
1870	March 1st	50	
	April 1st	75	
	May 1st	67	
	June 1st	25	
	July 1st	45	
	Aug 1st	65	
	Sept 1st	87	
	Oct 1st	75	

R03



1

Message No. \_\_\_\_\_

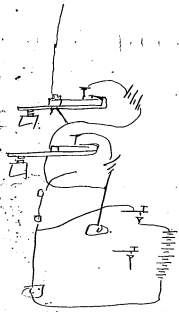
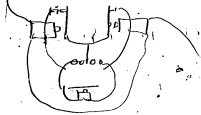
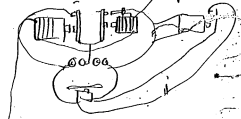
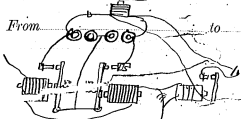
The Western Union Telegraph Company.

Letter \_\_\_\_\_

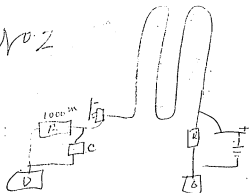
From \_\_\_\_\_

to \_\_\_\_\_

Sheet \_\_\_\_\_

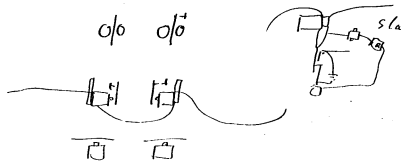


No 2

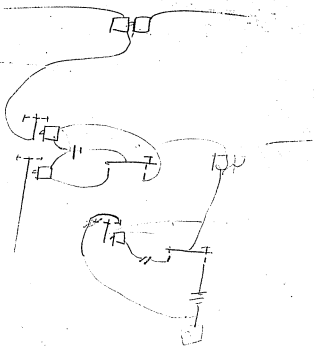


1

5

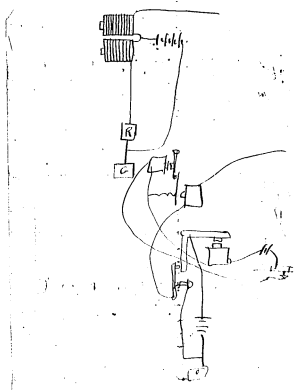


1



2-1

2



2-2

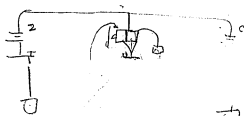
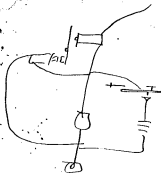
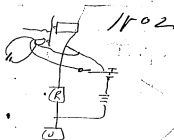
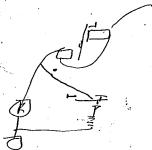
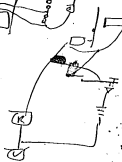
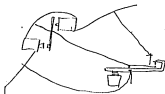
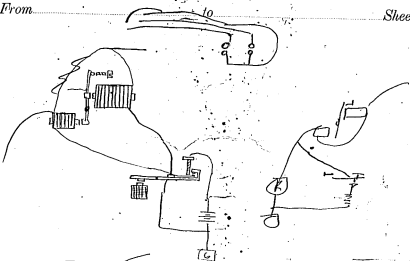
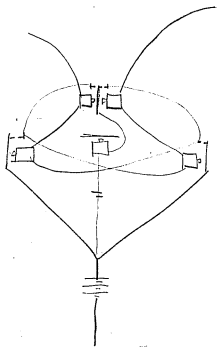
Message No. \_\_\_\_\_

The Western Union Telegraph Company,

Letter

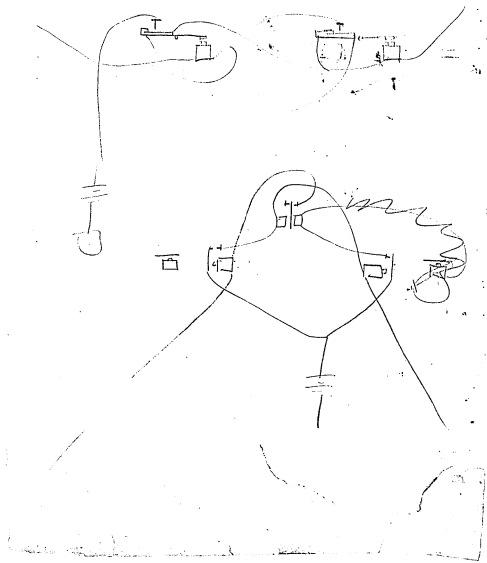
From \_\_\_\_\_

Sheet

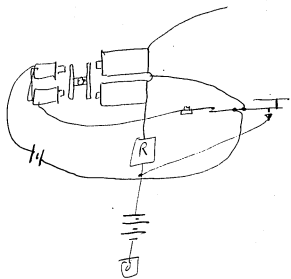


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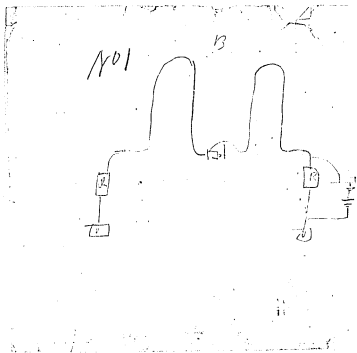




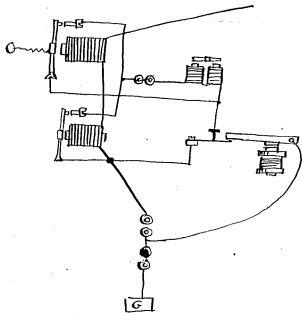
2



Brown

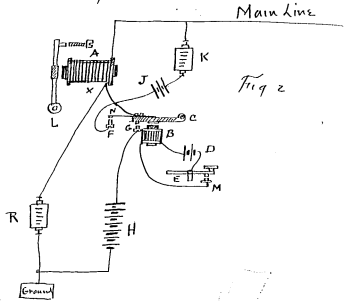


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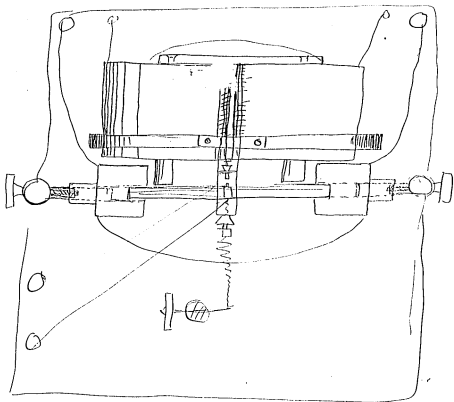
701

4



A is the relay B is the sounder E the Key D a local battery R & K resistances J a neutralizing battery H the main battery when the key E is worked the sounder works with it so when it is closed the lever C is brought down ~~the~~ putting the battery on the line through the point G a portion of the current from the battery going to the ground through R

2-3

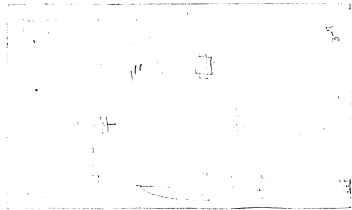
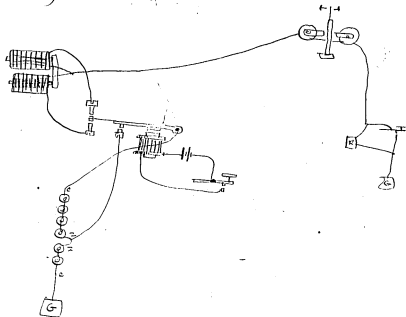


*Thau*

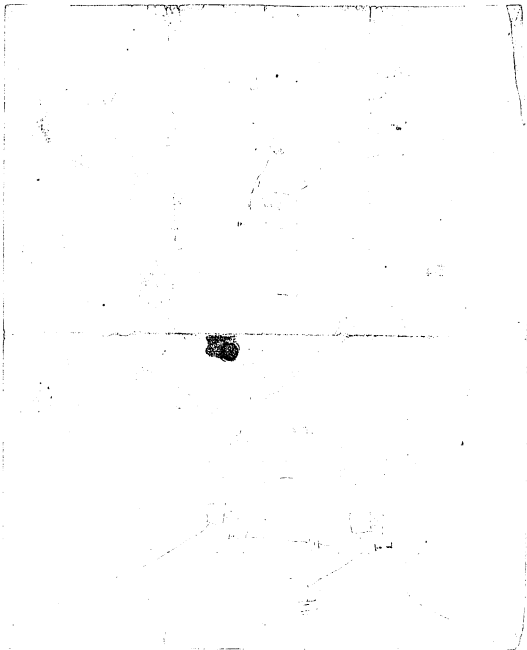
3-3

**3**

Brown Iny his



3



PLEASE RETURN THIS NOTICE WITH YOUR REMITTANCE.

**The Commonwealth Life Insurance Co.**  
OF NEW YORK,  
No. 178 BROADWAY.

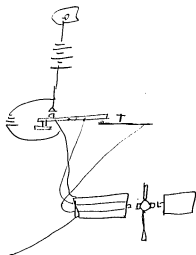
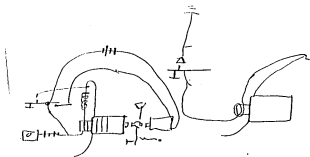
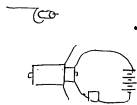
Mr. T. A. Edison  
The premium on your Policy No. 4957 for 4 Months  
will be due on the 30<sup>th</sup> day of July 1872

Cash Premium, \$ 69.62  
Cash Interest, \$ \_\_\_\_\_  
Total Cash Due, \$ 69.62

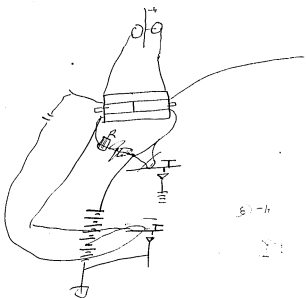
Blanchard & Smith  
Managers  
H. F. HOMES, Sec'y.

ALL CHECKS AND MONEY ORDERS TO BE MADE PAYABLE TO THE COMMONWEALTH LIFE INSURANCE CO.

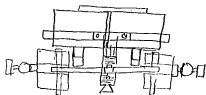
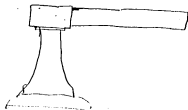
3



4



51-4



4

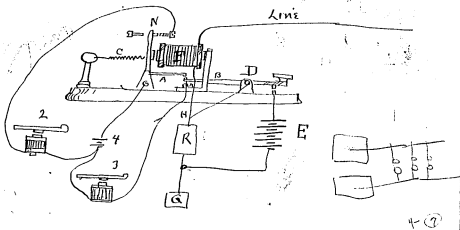


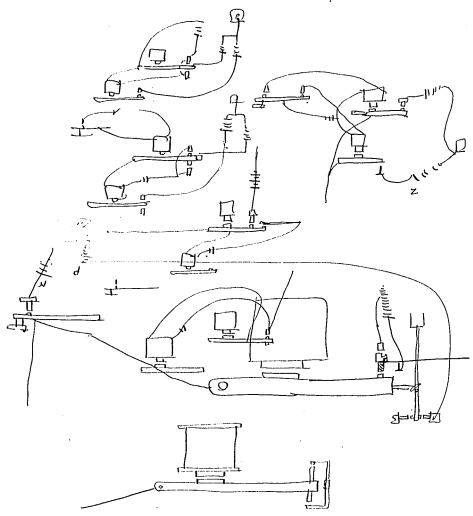
## Telegraphing.

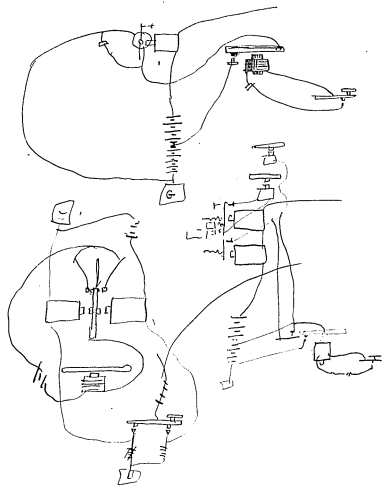
The object of this invention is to transmit <sup>any</sup> despatches in opposite and the same direction over one wire at the same time.

The invention consists in the mode of rendering nil the effect of the outgoing current upon the receiving magnet.

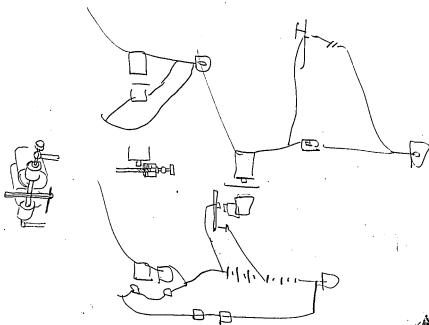
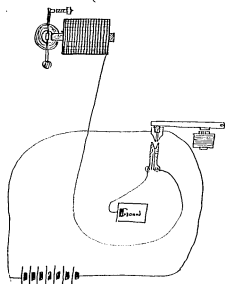
Fig. 1. represents one device.



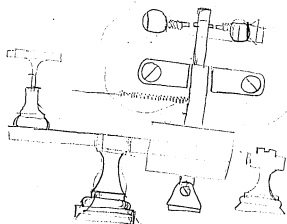
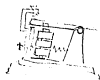
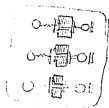




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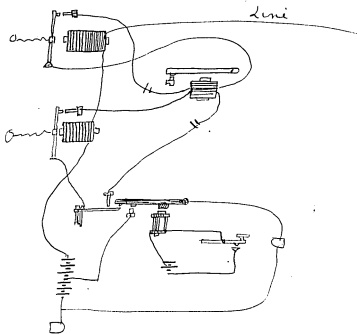


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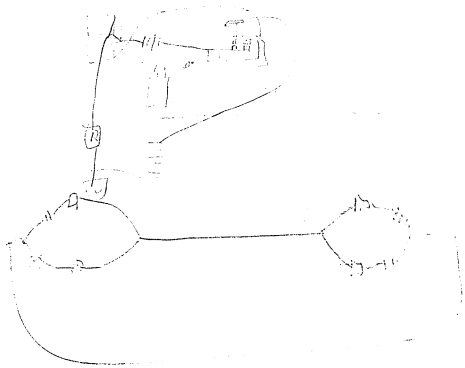
5

Handwritten text, possibly a name or title, appearing to read "Handwritten" or similar.



Brown  
Amateur Electrician -

5-7



**5**



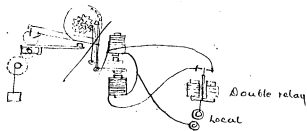


Thomas A. Edison

Thomas A. Edison  
Telegraph Engineer  
80 Broadway  
New York

T. A. Edison  
Thomas  
A. Edison

1861 No 2147. Meinrad Heiler, Printing Telegraphs.  
 Suitable Private lines. - Double pointed relay, polarized  
 Local battery. Transmitter "Key" Clockwork does printing  
 Type wheel related directly by local battery. Two  
 Escapements on type wheel. coiled springs - probably  
 same as Rowes Escapement, type wheel returns  
 Zero each letter printed. inked by band, <sup>reversed current</sup> no drawings



Second arrangement. single relay - no reversed current.  
 Local = long an short currents sent by Morse Key -  
 short currents work type wheel magnet long  
 current works either a second relay or  
 mechanical device which in responding to  
 long current cuts in printing magnet & c.

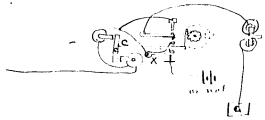
correct the level of which cuts type wheel very  
magnet ~~cut~~ = no drawings, says keyboard can be  
used, obscure -

1862. No 1065. Freak's Telegraphic Direct  
Printing Apparatus. Clockwork for rotating type  
wheel. printing direct by magnetism, printing  
magnet in local battery, operated by a  
mechanism operated by type wheel escaput  
inked by roller ratchet paper feed. Dials  
pointer attached Trans. Kinnays pendulum  
& clockwork, printing prevented with  
certainly by throwing in a gear ~~where~~  
into regular train gear should it vibrat  
- Drawings. Obscure.

1845 No 10. 959 Jacob Brett. printing telgh  
primitive clockwork, keyboard transmits long shaft  
clockwork friction & pins assisted. fly gear  
prints, open & closed rkt wheel on the shaft  
Escaput pins inside type W - interroll plumbago with c-2

Hydraulic regulator for effect of pntg. No pntg lever  
 ratchet wheel & pad feed etc drawn in low end  
 Type by a race & crank operated by a  
 Cam released by hydraulic piston or valve

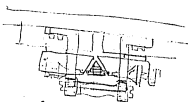
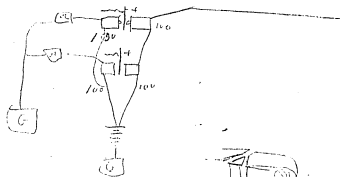
Siemens - 1850 Ernst Werner No 1306Z  
 Key board trans for pntg. Keys arranged in a  
 semicircle, type wheel made of thin watch spg spokes  
 raising with lilla soldered on end pntg on side  
 Escapement lever operated direct with magnet single  
 Siemens escapement printing lever magnet direct  
 Thus:



pntg lever places X which moves independt of C  
 back would vibrat if instant that C is  
 self vibrator. & slant quick

6-13

2



1865 No 2356. Wm Clark Com from Kirk Boyle etc  
Printing Telegraphs. Transmitter punched paper  
p 48 Currents, Double magnets, polarized armature.  
Vibrating est. works except. type wheel fastened  
on shaft by spring its contact being the inner  
part of wheel to rotate. = Vibrating point  
on Escapement Lever which closes printing  
local circuit when vibrations cease. Clockwork  
for both printing & type wheel. V wheel to hold  
type wheel steady when printing.

1834 No 1225. Edward Orange Wildman Whitehouse  
Printing Telegraphs. Gray & Barten = 25 keys -  
connected to 25 buttons spring on type shaft  
rotating Relay. Polarized relay. Double point  
Closing local circuit of type - except that  
Lever closed by arm on type wheel.  
(See translation)

1841 no 9204. Thos Wright & Alex Bain.  
Printing Telegraphs. Clockwork. magnet.  
working Escapement. prints by drop of  
Governor balls when train gears arrested.  
# obscure.

1860. 485- Pierre Antoine Joseph Dujardin  
Type wheel of metal letters of soft spring  
sub capable retaining <sup>oil</sup> ink, no ink rollers,  
flannel pad, when printing type depressed  
small portion of ink cut printing lever  
supplied to two clockworks 1 for type w  
other for print. Hand handmill printing  
done by depress. handle train.  
Escapement worked by double polar  
Magnet & via lever on polar magnet  
clasp. found in rot. ink printing magnet  
the lever dont respond when make  
quick Very good ptr =

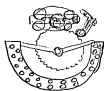
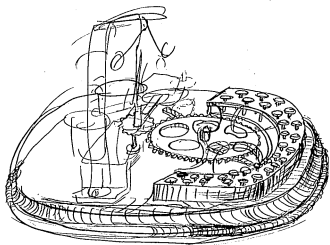
68

1864. 1913 Rejinder

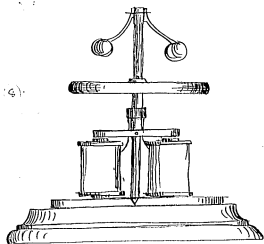
Modification. Self-relaying component which sends back to transmitting station the number of its rotation magnet lever rotates with it but keeps clear & does not relay it until its current interrupted at home station, palamed double relay vibrating

1850. No 1514. Jacob Broth printing Telegraph Clockwork for type wheel. Double palamed magnets. Armature which works escapement. This lever has 2 stop points connected to magnet in local battery. This magnet don't act when lever vibrated when stopped. Release a shaft which in giving one revolution closes a local current in which a printing mag which print. field done at it also closes second mag which let. delay except & type wheel fly back zero



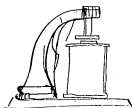


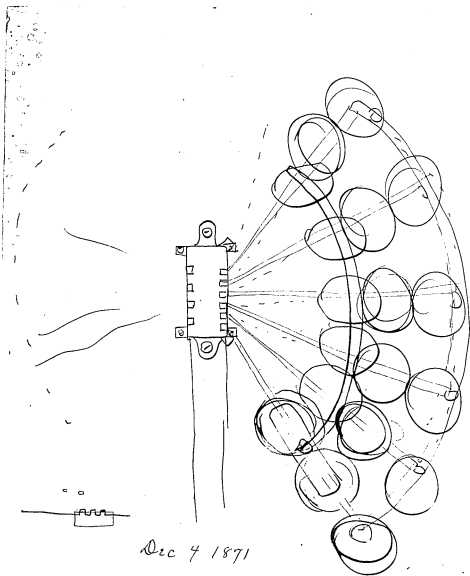
Dec 15 1871



6

Dec 15 1871

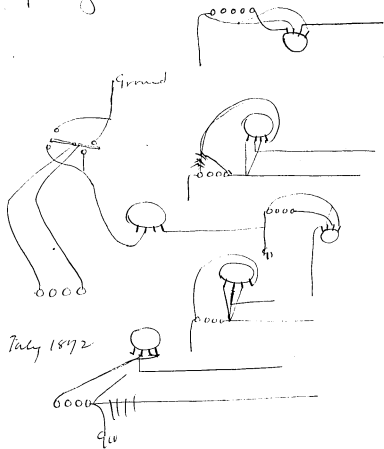


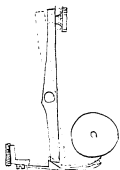


Dec 4 1891

11-1

the invention consists in the combination of a number of finger keys arranged under a ~~edge~~ under a cylinder or drum and actuating contacts springs





7

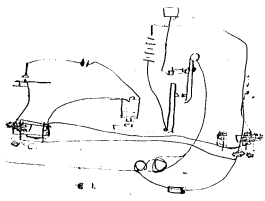


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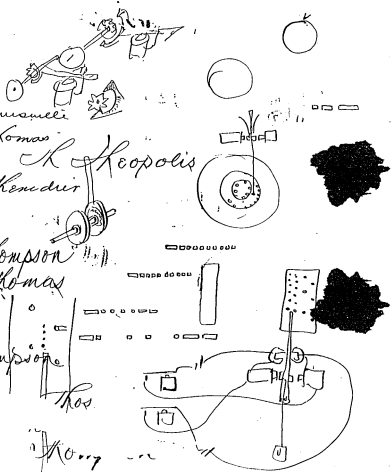
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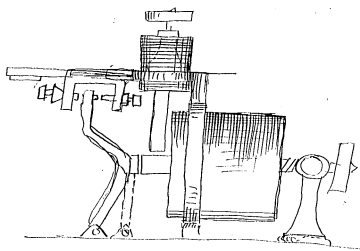
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Kamanuli  
 Komos  
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 Kheodur  
 Kompson  
 K Komax  
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 K whatever  
 Griffin. 9



8



Khan



battery, and so connecting the coils that when the main line current enters the relay, the magnetism induced by the local battery is neutralized the consequence of which is that a current due to the demagnetization of the iron core will be sent upon the line in the same direction as the main current thus helping it instead of neutralizing as an ordinary Relay or magnet would and when the main current is broken the iron core becomes instantly magnetized again by the local battery and the act of magnetization would send a current upon the main line in the opposite direction thus neutralizing the currents due to the discharge of the line. Thus the ordinary relay magnetizes the core when the current is closed, but in this relay the magnetism which is already in the core by reason of the local battery is neutralized the consequence of which is to reverse the direction of the

inductive current and use them for discharging or neutralizing the current due to the discharge of the line.

I place a number of these relays along the line to neutralize the discharge current at every part of the line at the same instant

These magnets may be provided with armature levers & adjusting springs the same as the ordinary Morse Relay and used as a receiving instrument

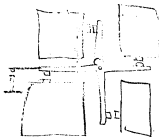
The adjustment of the local battery may be done by a Rheostat described in a later previous patent.

The local battery could maybe dispensed with and an adjustable permanent magnet used.

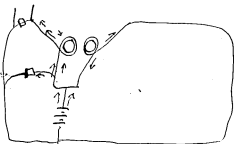
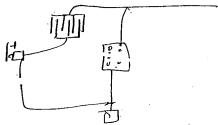
I claim one or more relays as described placed in a chemical telegraph line for the purpose set forth.

8

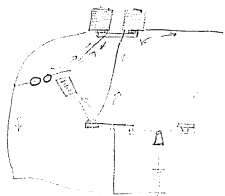
Nashua 21 Amonton



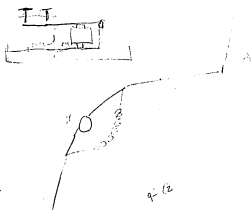
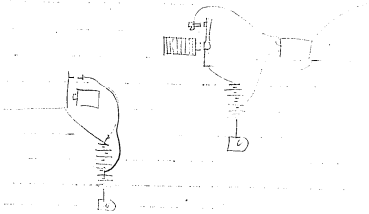
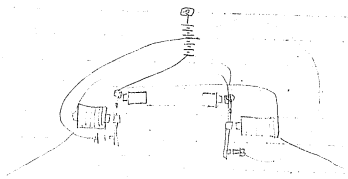
The effect of placing electro-magnets in the main line of a Chemical telegraph is to neutralize a portion of the signal by sending a counter current and when the battery current is broken the relay or magnet send a current in the same direction and prolong the signal beyond that prolongation due to the discharge of the line. I have taken advantage of this axiom by placing these magnets in a short circuit or shunt where the conditions are reversed and when the signal commences the shunt set up is against the current coming down the shunt but with the one going down the paper the consequence of which is to augment the blackness of the mark and when the battery is taken off the relay discharges a counter current neutralizing the current due to the discharge of the line thus leaving a perfect character upon the paper. I also now place relay or magnets upon the line which are the opposite of the ordinary relay or magnet which causes a prolongation of the current, by putting an extra coil of wire upon the magnet and magnetizing it by a constant local



(10-6)



Delivery



9

"Formosa"

Brief is a general delivery day.  
 Buyer or seller: say 13: means sold  
 to be delivered at next delivery day.  
 Cash - Gold - Put, G.  
 Leaves a vacancy for  $\frac{1}{100} =$

(10)

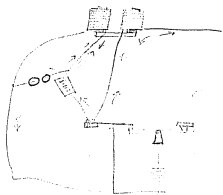
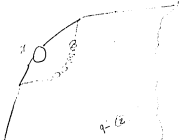
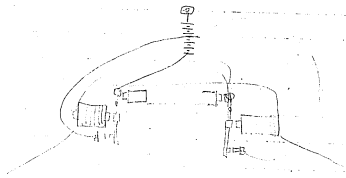


Diagram 10



9

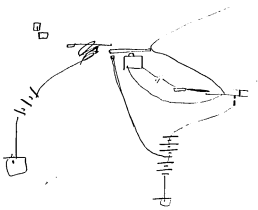
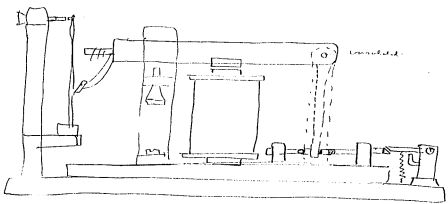
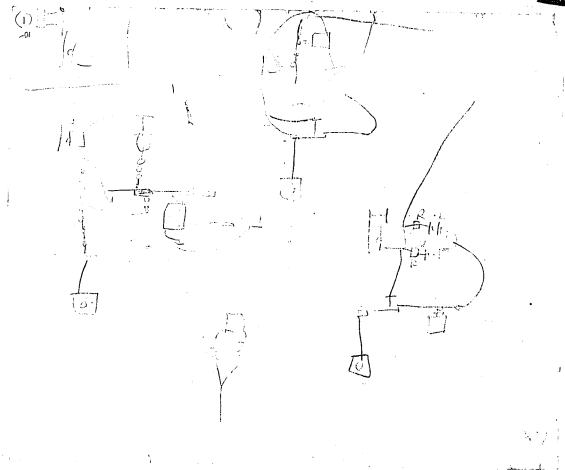
"Forman"

Brief is a general delivery day,  
 Buyer or seller say - B. means sold  
 to be delivered at next delivery day

Cash - Gold - Put, G.

Leaves a vacancy for a Yu =

13



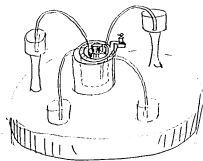
10

Filter Prussiate Potass. solution through Bone black or Charcoal

Make a battery with powdered carbon and solid carbon in a porous cell and use red fluid.

Also one with powdered Zinc in a bag or cloth in a calland battery.

Arrange a battery with syphon this



Add chloride of Sodium to a Prussiate solution to make it clear  
Also to acid solution.

Prussian Blue is dissolved in Rain water, acidulated with oxalic. 10-63

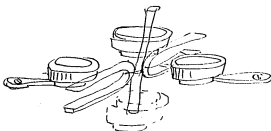
The Gold and Stock Telegraph Co.,

Executive Offices,

No. 61 Broadway, New York.

New York, ..... 187

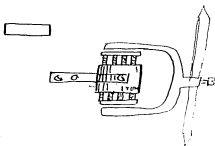
MARSHALL LEFFERTS, President.  
JOSEPH M. COOK, Vice Pres't  
NORMAN C. MILLER, Sec'y & Treas'r.  
GEO. B. SCOTT, Sup't.



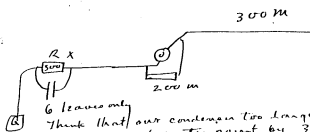
Electro motor

fine wire thrible quantity Connected

also

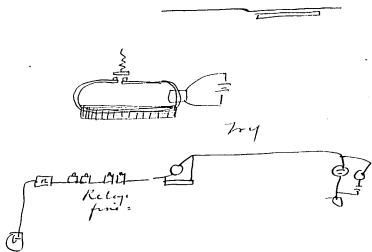


The Closed circuit in a contrary  
direction & this Discharge current  
made equal to the tailing produced  
by the necessary material being  
out of the Centre of residual  
rotative induction =

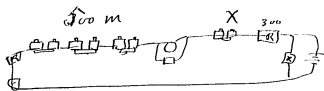


6 leaves only  
 Think that our condenser too large  
 want to get center point by 300 m in R X  
 and increase or decrease condenser

Make Condenser by taking cover to my  
 box apart & taking out leaves and  
 gradually increase =

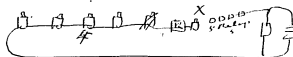






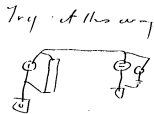
Short circuit

See if X dont discharge quickly



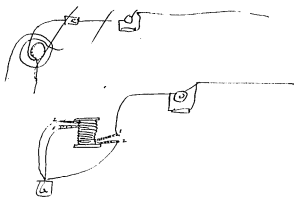
See if X dont discharge quickly

Make a magnet by getting long  
fox and making all long  
Cores into one then



wind a large spool of silk covered wire no 36.  
 dipped in paraffine with 2 wires to be used as  
 Condenser this to make 500 miles resistance Bradley

210



Wind a large resistance magnet Bradley with  
 that fine wire and put a piece tin foil  
 between with shellac paper have each piece  
 tin foil fastened together & connect to  
 ground and lead wire pass through fine  
 wire

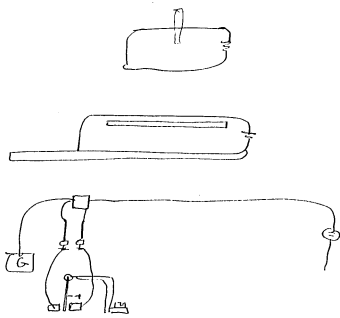
11-61

The perforated paper is drawn rapidly between metal rollers included in the electric circuit. The upper roller being suitably shaped to enter the perforations and mounted at the extremity of an arm actuated upon by a helical spring.

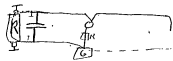
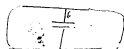
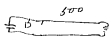
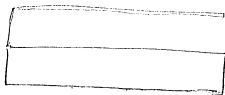
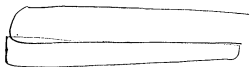
Whitcomb - Chemical Polygraph of, to obtain infinitesimal Earth Contacts platinum, (respectively connected to the line & an earth plate) are welded into a glass tube containing distilled water or oil fluid.

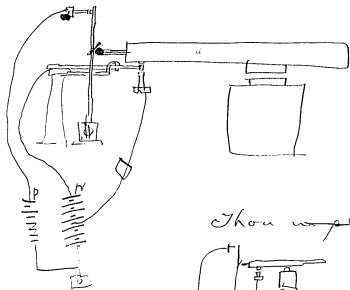
A no. Patent using two leaks at each end of it. here made of german-silver wire to measure the time of the electric current.

Early used leaks,

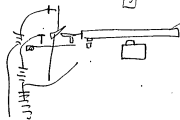
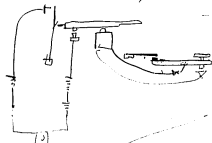


Pith Relay





*Thou implement*



R-14

by the same amount of resistance in  
the artificial line.

When this is done there is a  
discharge current from the artificial  
cable or line. Contrary to the regular  
current, leaving the writing sharp  
and clear except at very high  
speeds isolated dots are weakened  
to too much counter charge

but if the instrument is placed in  
the artificial circuit, or farther away  
from the center of resistance towards  
the artificial the discharge current  
will be in the same direction the  
amount being gauged by the resistance  
on the great or the line side increasing  
or decreasing the resistance of  
the artificial cable or line.

It can be so gauged that a slight  
tail or record of the discharge current  
is shown on the paper in the same  
direction the isolated dots being as  
clear as any. This tailing can  
be got rid of by placing in the shunt  
which is applied to the chemical  
pipe to preserve an even resistance  
an Electro magnet the discharges  
of which will take place with 12-11.



in the centre of resistance and static induction. The signals are perfect at any speed no matter what the inductive capacity of the cable may be, (the artificial cable being made the same) the legibility of the chemically recorded signals is dependant only upon the tension of the battery if 1000 words per minute is obtained clearly with 50 cups then 100 cups will be necessary to obtain 2000 words as legible.

The transmission of waves of electricity are instantaneous no matter what is the length of the cable. The retardation noticed by electricians in cables is ~~due to the~~ not properly retardation but the Leyden jar charge sending its current against the charging current. The same as an electro-magnet placed in an electric current. The first <sup>part</sup> pulse will be weakened by the counter charge against the magnetizing current.

If in my system the <sup>Resistance of Ch</sup> instrument is added to the line, and the total Resistance, is to be compensated for

~~one~~ out of the center towards the  
 artificial the dots come all full  
 but ~~one~~ ~~on~~ with slight tailing  
 but legible - over the center  
 on line side first dot weakened  
 by return charge individual  
 against + dot after dash  
 very bad or first dot of  
 dash - in high speed.  
 make letters this way

a

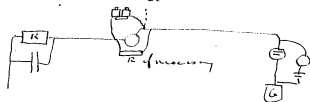
.oo   oooo ooooo

The use of small holes is to charge  
 line but they don't show on paper  
 $\frac{1}{2}$  current is sent for dashes  
 + full for dots the dashes are  
 in one row & dots in a small  
 double pens

13

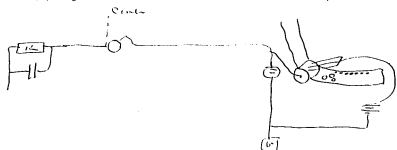


high resistance magnet  
Center



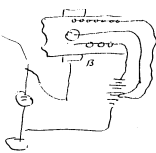
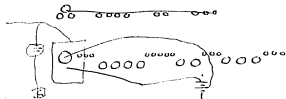
The magnet is used to cut off trailing  
due to being on other side of center

also this



use of small slots to  
keep line relatively  
changed with current

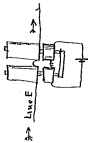
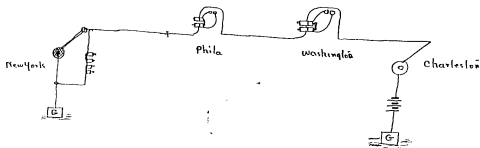
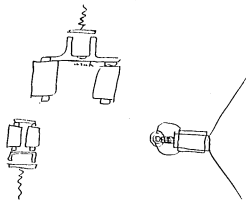
also



12-4

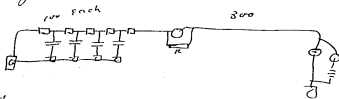
Borrow Several Regular Rheos  
from deffalt, etc. etc;

Try this

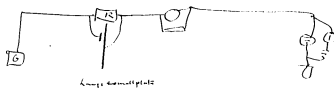


12-107

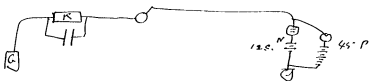
Try this again.

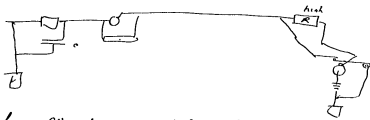


Try the

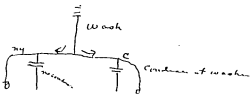
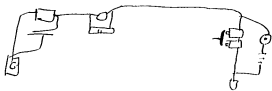


Change commutator





Send from Washington with large battery and high resistance coil, and discharge through No resistance by mechanical Motion of hollow lens - This will give intensity current little induction a big volume change

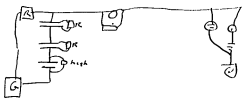
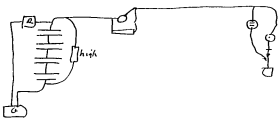


11-17

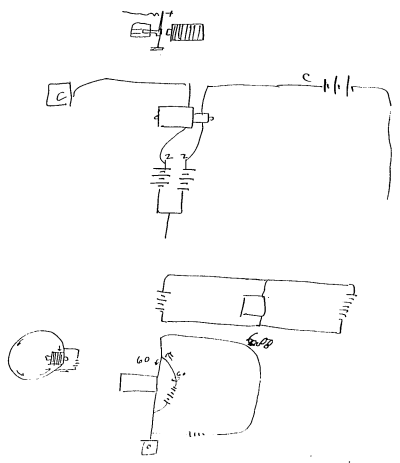
Make a Condenser with quarter size sheet  
for line & full for ground

Make a  $\frac{1}{2}$  Condenser with "Mica plate  
papers" or Tissue paper & paraffin very  
close together holds charge longer

Make Condenser  $\frac{1}{2}$  3 thickness thick paper  
between plates

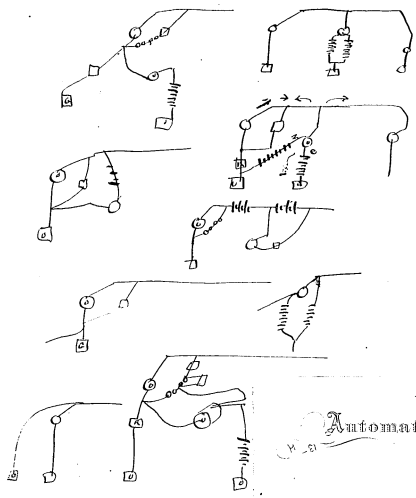


12-54



10-19

111-51

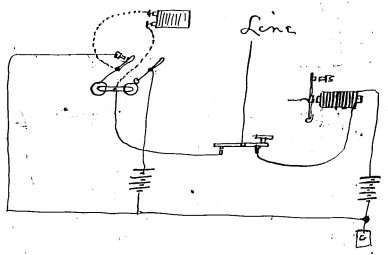


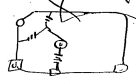
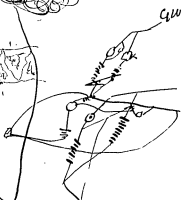
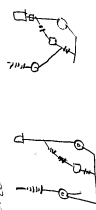
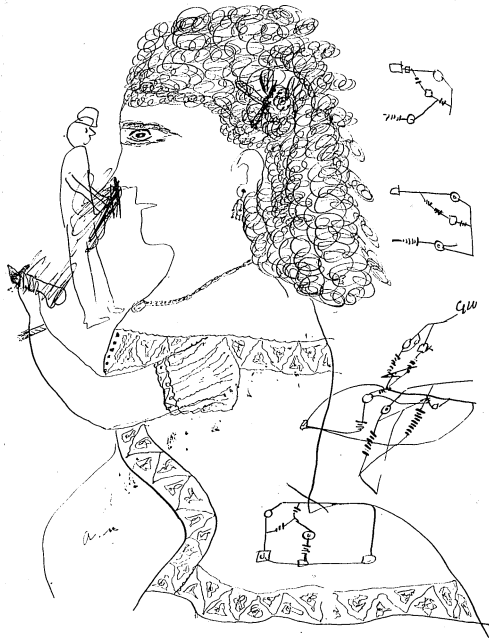
Automatic Telegraph Company,

80 BROADWAY, ROOM 30.

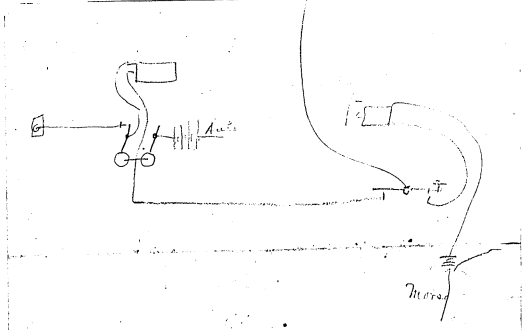
New York, \_\_\_\_\_ 187

13

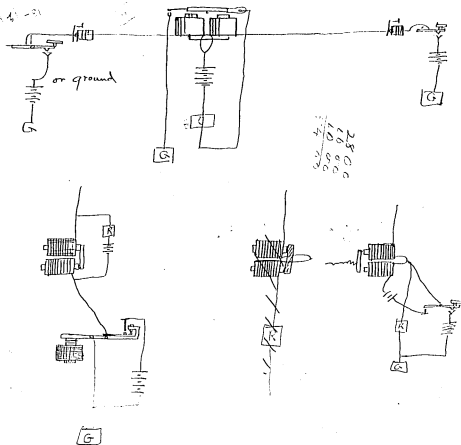


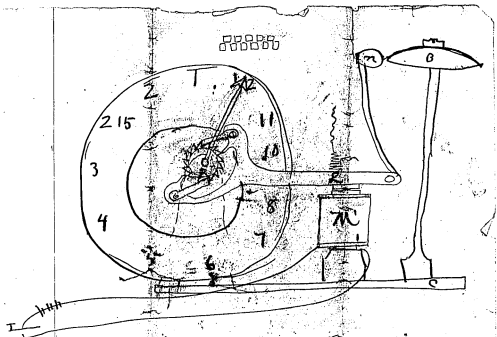


13









The object of this invention is to produce at a distant station the exact time at given intervals and the striking of a bell to call attention to the time

### Description

M is the magnet which operates the Mechanism  
 B is a bell connected with the base C.  
 L is the Escapement lever one end engaging with pawls in a ratchet with clicks the other end having a ball which strikes the Bell B. On the shaft which carries the Ratchet wheel R, is an arm or Pointer which rotates around a dial which carries upon its surface the hours in Arabic Numerals or Roman Numerals. At each passage of the Magnet the Escapement is rotated one tooth and the bell is

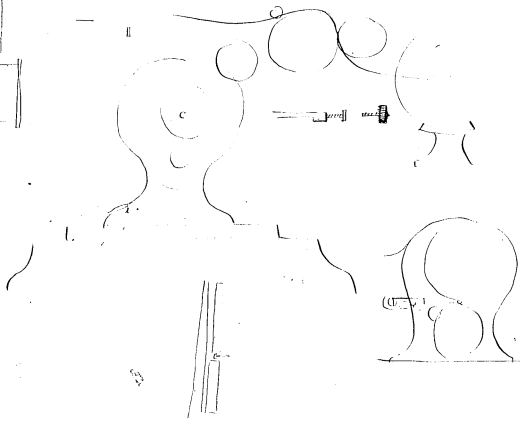
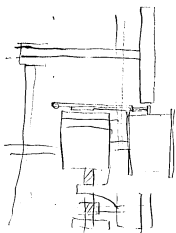
Sounded.

= Operation

When a Standard Clock is placed at the Main Station it is so connected with the Main Line containing the Indicators by the usual Device that when it arrives at a given point a Break Wheel is set free & the Current is intermitted upon the Line as many times as is necessary to bring the Indicating Apparatus at the same point as that upon the Regulating Clock =  
At every change of position the Bell is Sounded = so as to call Notice.

My Claims will probably be

The Combination of ~~an Electro~~ & a Magnet with the Escapement Indicating Dial & Bell with the Main Regulating Clock arranged & operated substantially as described for the purpose set forth

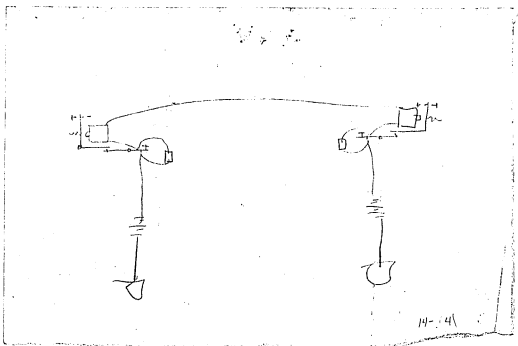


14

at the instant the  $c$  closes on  
 the point  $g$  the points  $K$  &  $F$  close  
 and ~~short~~ throw an opposing  
 Battery  $J$  on the relay, which in its  
 Effects is equal to the <sup>but in opposite direction</sup> battery  $H$ .  
 Consequently the effect is neutralized  
 any variation between the two Batteries  
 being compensated for by adjusting  
 the Rheostat  $R$  to make the Effect  
 of the battery  $J$  weak or strong.

The above shows that in case

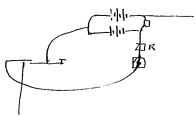
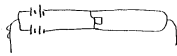
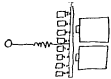
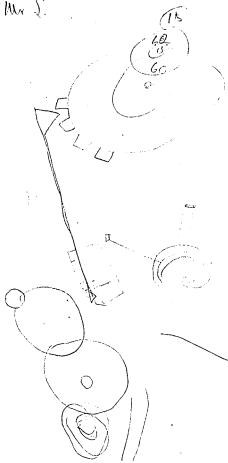
14

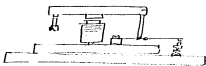
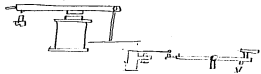


Mr. J.

14-12

15  
10  
5  
60



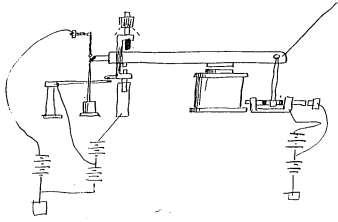


Also



H- 53

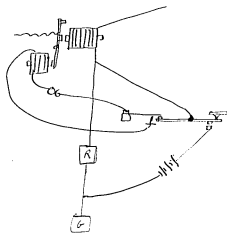
Top



15-11



Duplex



T. 111

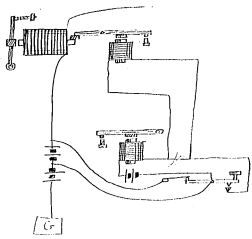
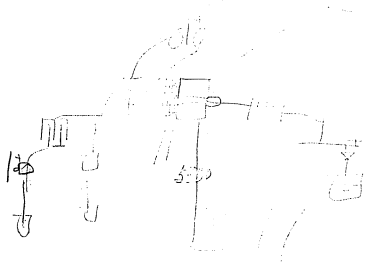


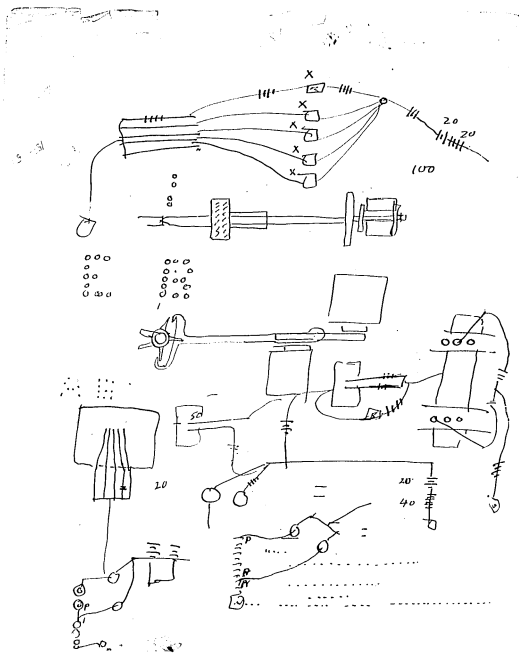
Diagram 111



15

c





Hemistoles  
 Sonizaq Dona, D'obra  
 Cenci Portoceli  
 Dorado El Dorado  
 Eldorado

This is a specimen

This is a

This is a specimen of the blind writing

This is a specimen of the blind writing

The whole district Memis this is a

This is a

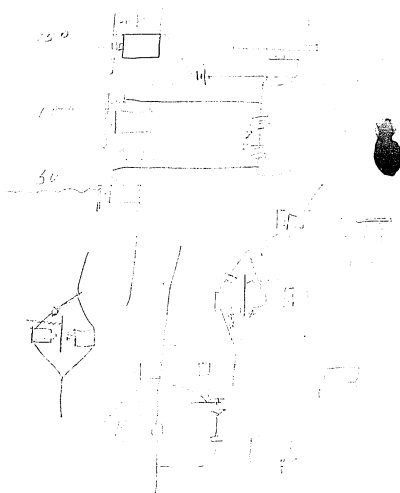
ABCDEFGHIJ  
 KLMNOPQRST

ABCDEFGHIJK LMNOPQ  
 RSTUVWXYZ

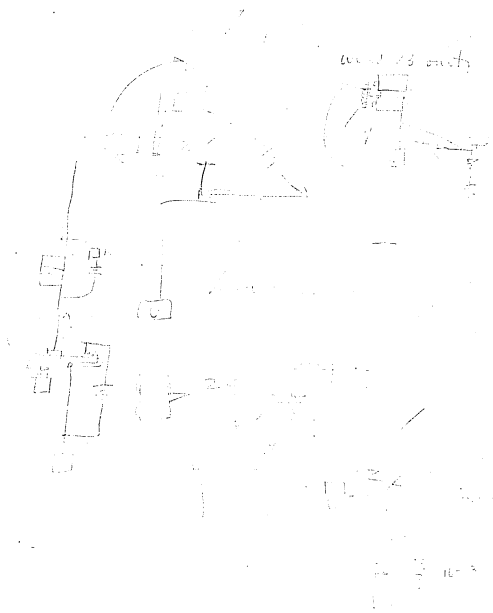


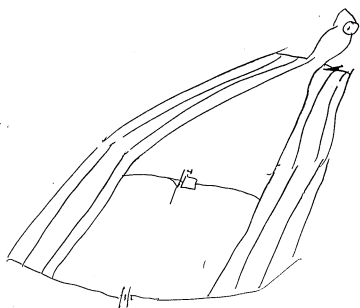
A yellow oasis in hell -  
premeditated stupidity - A phrenological idol.  
The sombre dream of the grey-eyed Corsican  
A brain so small that an animacule went to view it  
with a compound Microscope The wrestling of  
shadows, a square chunk of carrion with two green  
eyes held by threads of gossamer which floats at  
midnight in bleak old rural graveyards.  
Three million miles beyond the limits of the  
universe where the angels dare not go  
There flies forever from nihil to nihil the foulest  
demon of the Cosmos.

20.19, p. 15



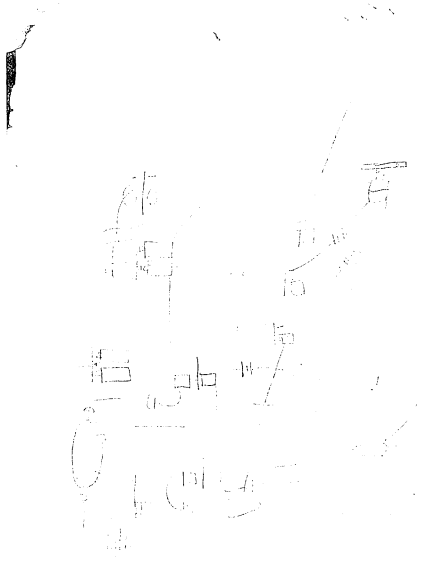
16





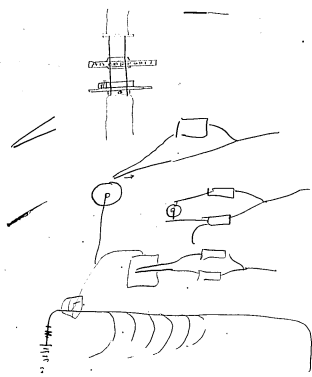
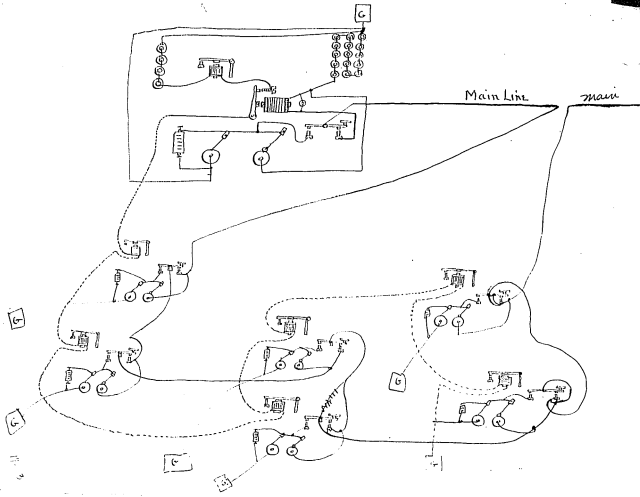
16





Batchelor.

Please look at Dates of first work for  
District Alarm what date first report  
what it was & all dates & names  
of men employed on it.



17

OFFICES.

New-York:  
66 BROADWAY.

Philadelphia:  
310 CHESTNUT STREET.

Washington, D. C.:  
1409 PENNSYLVANIA AVE.



Geo. Harrington,

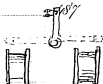
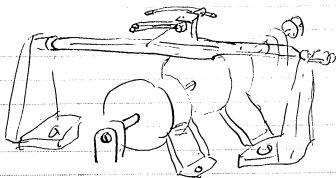
PRESIDENT.



J. C. Reiff,

TREASURER.

To





You are invited to the  
 for the morning session  
 at 10:30 AM  
 English  
 3226 R. A. B. B. B.  
 3226 R. A. B. B. B.  
 3226 R. A. B. B. B.  
 at home, I have a  
 at home, I have a

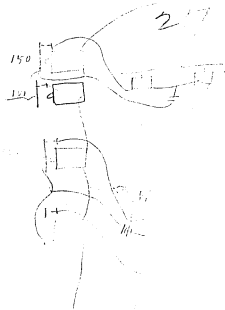
You  
 I am glad to hear that you  
 of them to have the same  
 that you receive from  
 the same

C. C. Shen  
 Santa Cruz  
 Pacific American

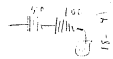
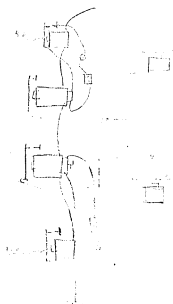
[Cat. 298  
p. 18]

*Handwritten notes, possibly a title or description, written diagonally across the top right corner.*

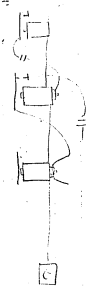
A01

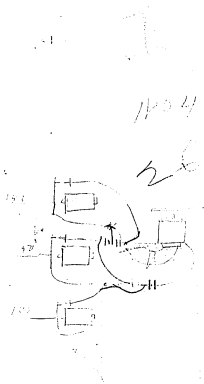


A02

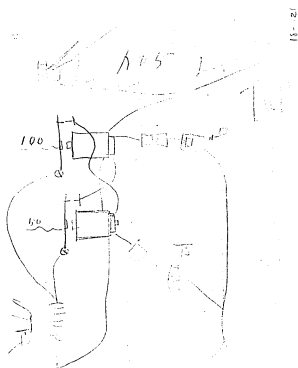


A03



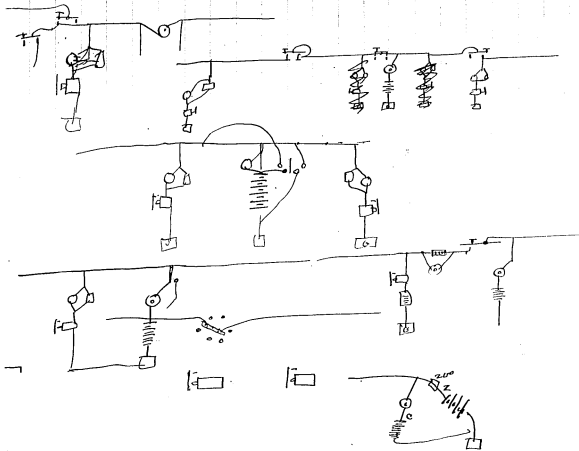


13-13



13-21





12-2

**OFFICES.**

New-York:  
66 BROADWAY.

Philadelphia:  
310 CHESTNUT STREET.

Washington, D. C.:  
1409 PENNSYLVANIA AVE.

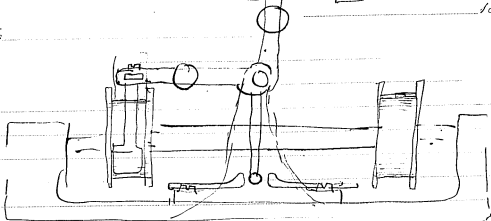


**Geo. Harrington,**  
PRESIDENT.

**J. C. Reiff,**  
TREASURER.

187

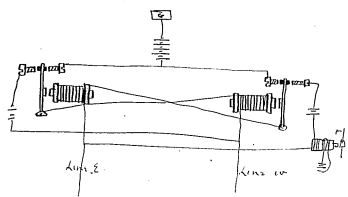
To





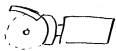
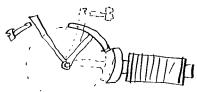
Brown

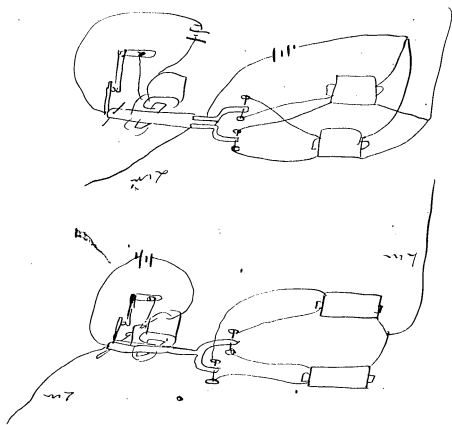
Try this repeatedly



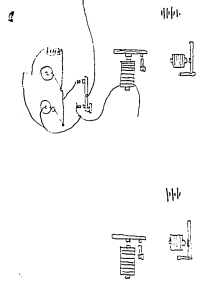
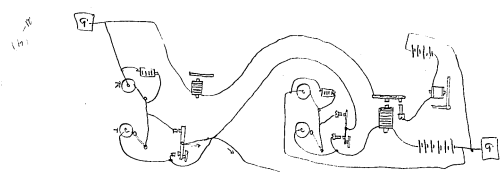
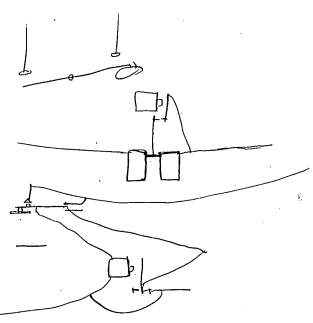
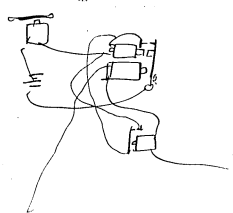
~~spring of necessary size~~

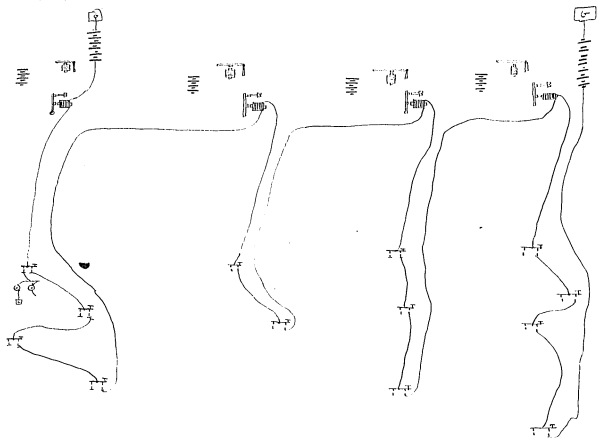
Try this

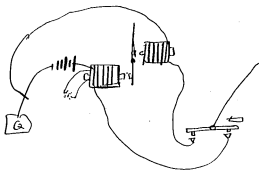




21

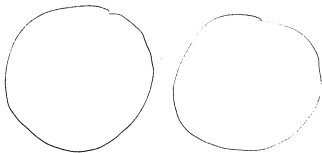






Brown try this

2-20 1.

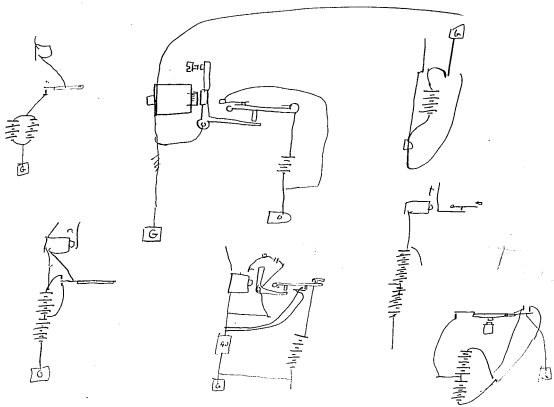


The South  
S J J Revolution

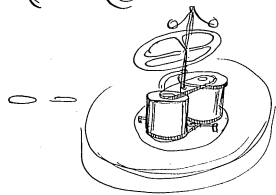
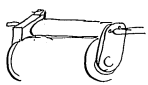
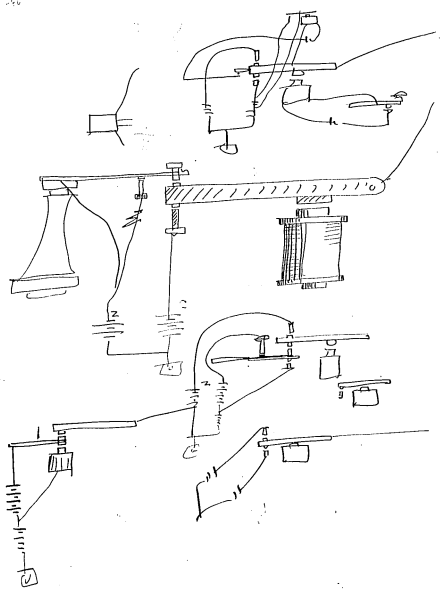
The Forasik Norman Miller  
Stanwix 7 Wm. Oton







22.3



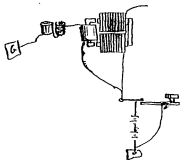
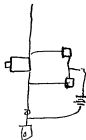
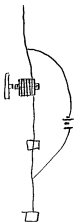
23

Automatic Telegraph Company,

80 BROADWAY, ROOM 30.

New York, \_\_\_\_\_ 187

Wen

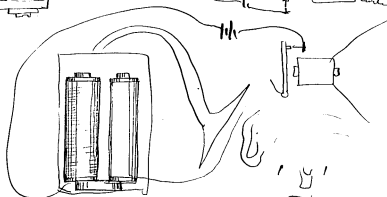
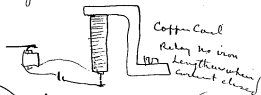


23-41

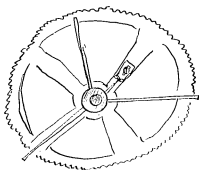


Indicator for Automatic Telegraph  
 instead of Kettle Needle in Water  
 a glass tube with a sliding  
 spindle - this tube  
 filled with a solution of

pt pyrosulphate of iron  
 saturated =  
 206 p Lysell, Transmagnon

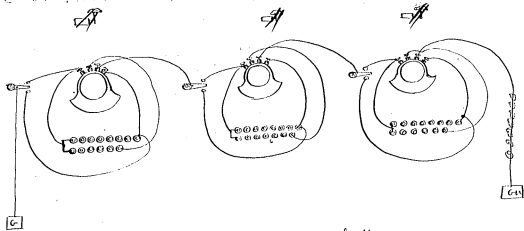


a long magnet ~~stick~~ in a tube with a  
 Ear Magnet 30 cups local on worked by  
 Machine Relay - this will give a sound  
 fact like a sounder Lysell drawings  
 page 243



This plan is a direct copy from the  
 3 a ... ..

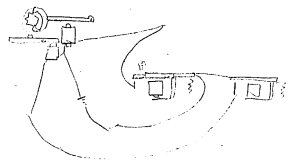
10-14



Arranged without a main battery,  
 The 8 Engine Cops at two places  
 are thrown in making 16 cups for main,  
 for a <sup>two</sup> mile line Each Engine should have  
 18 Cops Call and =  
 15

As now Cotton 6 miles require 2 mts

Make model



Two foot line and Rail ways

24

## Quadruplex.

The object of this invention is to transmit four (4) messages over one wire at the same time two in one direction and two in the other direction.

The invention consists in transmitting positive and negative currents to effect a polarized relay, and increasing and decreasing the same to effect an ordinary relay or magnet, substantially as described in a previous caveat filed by me relating to this invention,

The invention further consists in providing the polarized and common relays with double coils and arranged an artificial circuit at each end of the line so that the effects of the outgoing battery shall or can be balanced upon the two relays at the receiving stations,

24 75

The invention further Consists in arranging electro magnets shunted arounds the extra Coil of both relays to nullify the Effect of the static Charge upon these relays.

The invention further Consists in shunting the Line coils of the polarized Relays to prevent their self induction being thrown on the line wire,

It further Consists in the various Combinations ~~single~~ and as a whole -



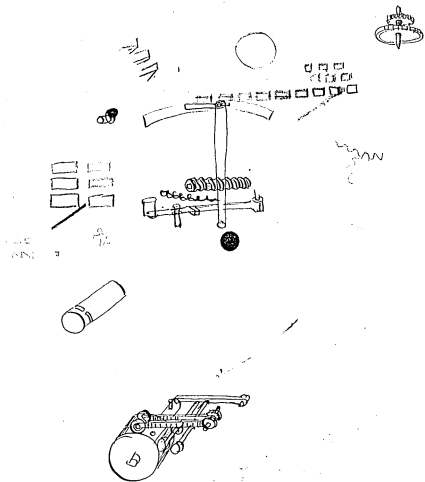


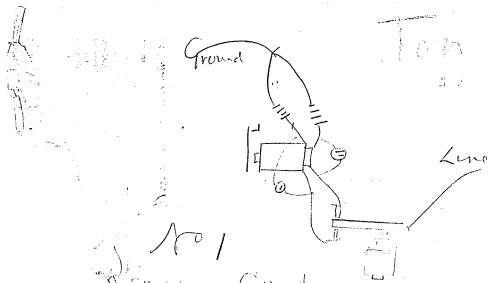
XXXXXXXXXXXX

25

try number of Relays in  
streams Duplex Duplex  
Ckt instead Persistence  
Coals =

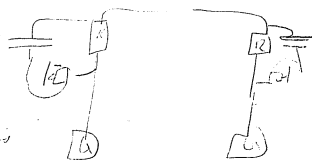






Reverse a current  
 up a Duplex Relay  
 and separate it

26-11



26-12

## Telegraph.

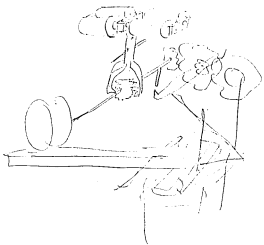


known that I. \_\_\_\_\_

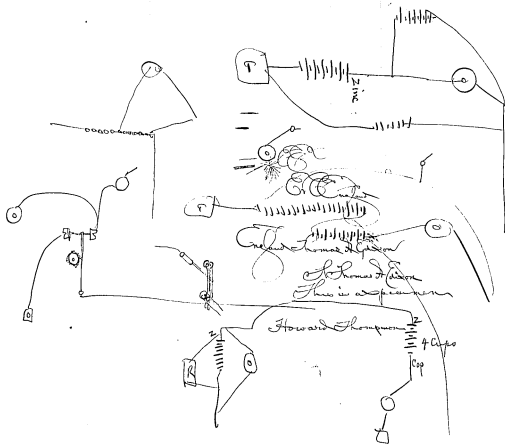
etc =

The object of this invention is to transmit automatically to a distant station, <sup>or electric telegraph station</sup> different signals, characters etc ~~in such a manner that is and arranging the electric circuit in such a manner that~~

The machine is provided with a number of keys arranged in such a manner that the depression of any one of them places a Contact spring upon a piece of paper placed on a drum. This paper being provided with ~~per~~ holes of different length through which Contact is made, and by releasing the clock work by another key, the signal is automatically given upon the line and recorded at the distant station, the main object of the invention being to provide a cheap <sup>simple</sup> and reliable telegraph machine requiring no reliable gears to give the signals.



26-13



OFFICES.

New-York:  
66 BROADWAY.

Philadelphia:  
310 CHESTNUT STREET.

Washington, D. C.:  
1409 PENNSYLVANIA AVE.



Geo. Harrington,  
PRESIDENT.

J. C. Reiff,  
TREASURER.

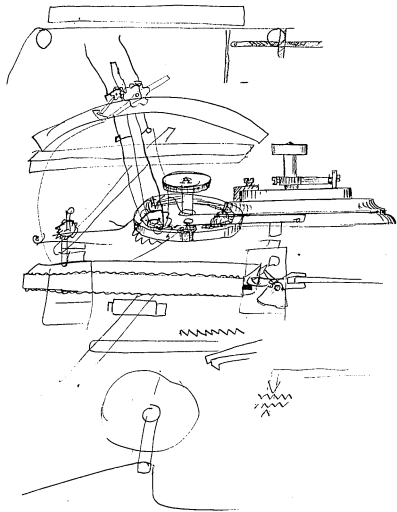
To

187

drop of mercury placed in tube  
to which will grow a thin  
plate in section apply gentle heat  
then add strong bar to solution  
- it quickly increases to prodigious  
proportions.

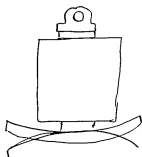
27

27 (5)

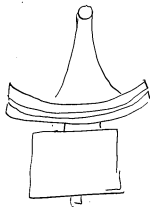


21-2)



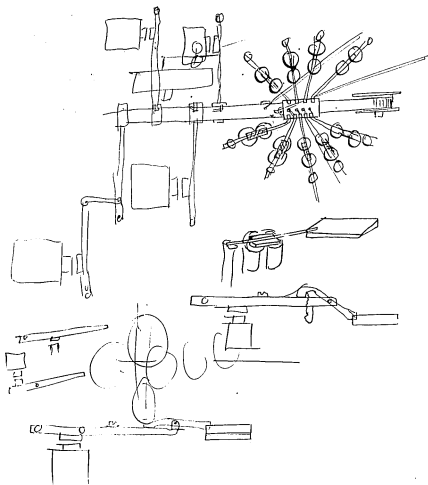


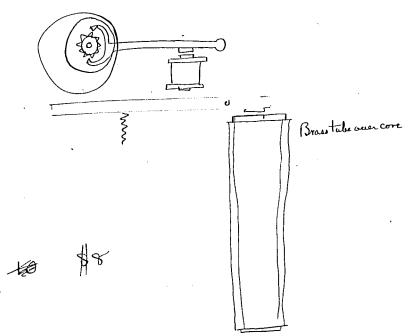
Try This Experiment  
See if it won't draw to  
the center -



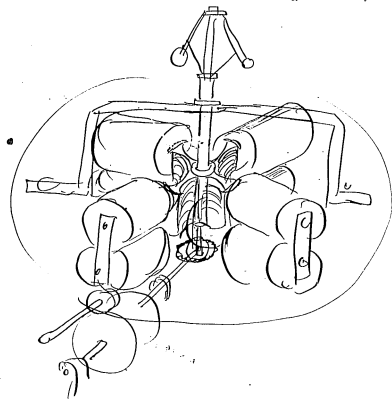
Write to Robert Hemmingsway Covington Ky  
if he is a mfr of glass monitors, & could he make  
some small ones







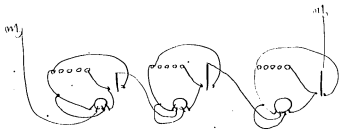
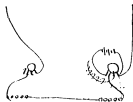
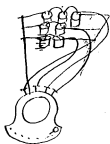
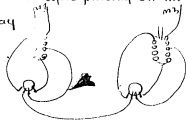
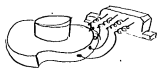
2 1/2" or less



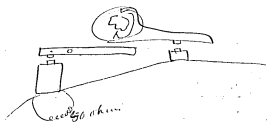
(2) - 88

Bentley.

When you receive "Universal Privates" you had better have a local battery arranged in your office to test each one before placing on the line, the batteries should be arranged this way

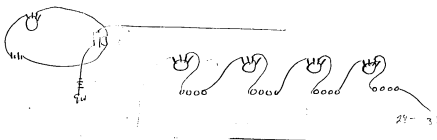
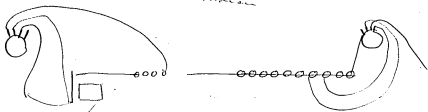
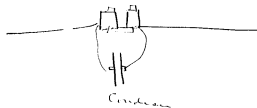


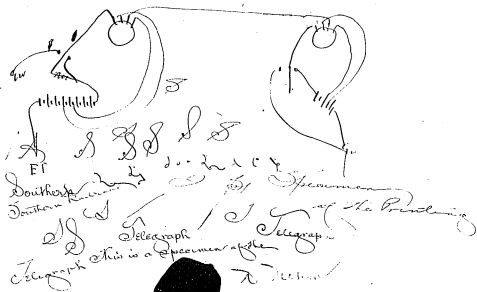
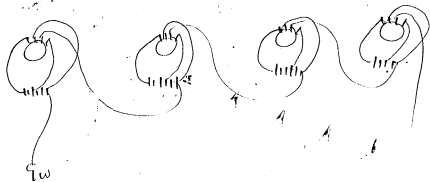
o o

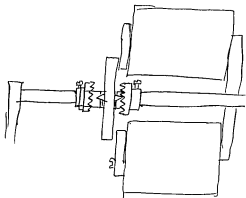
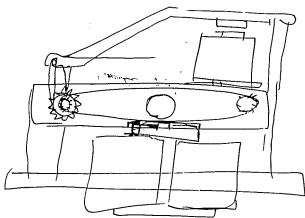


Principle for a flexible sheet over a curved element  
making it straight not slow

to work quick



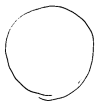




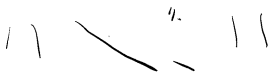
Sept 10 1872

28-15)

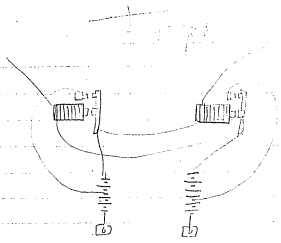
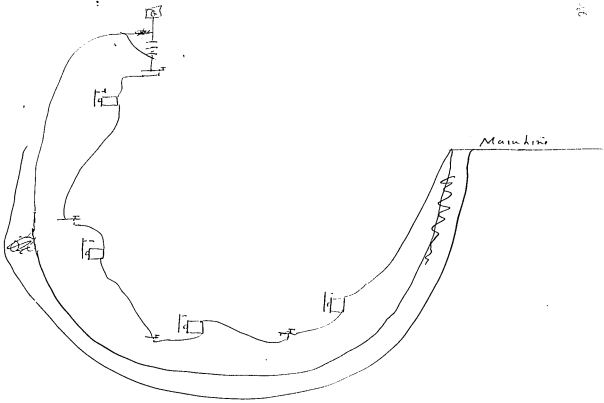




July 15 1972



28-11



28-12

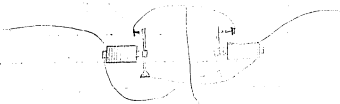
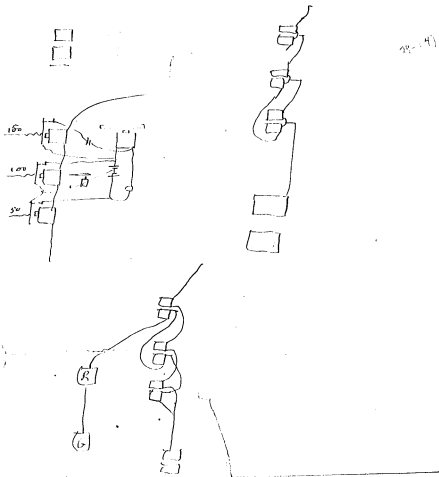
The Gold and Stock Telegraph Co.,

Executive Offices,

No. 61 Broadway, New York.

MARSHALL LEFFERTS, President.  
JOSEPH M. COOK, Vice-Prest.  
NORMAN C. MILLER, Sec'y & Treas'r.  
GEO. B. SCOTT, Supt.

New York, ..... 187

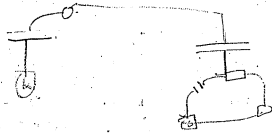
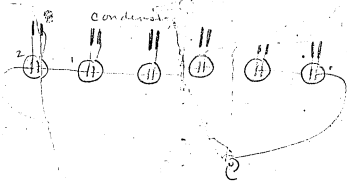


||| |||

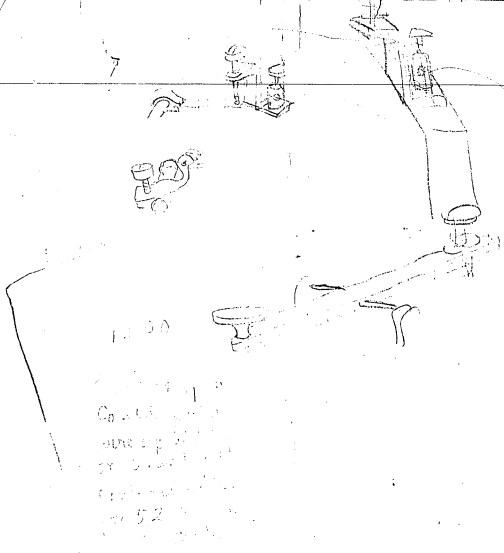
TOP

29

29-09







1410

11 parts of water 1 Sul  
acid - Resolow. 1,000,000  
grain than Copper.

Keep the

try a warm piece of  
lod paper & a cold piece  
See which is best  
Dissolve the  
Sulphur

The Gold and Stock Telegraph Co.,

Executive Offices,

No. 61 Broadway, New York.

New York,

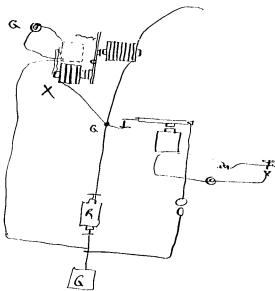
187

MARSHALL LEFFERTS, President.  
JOSEPH M. COOK, Vice Pres't  
NORMAN G. MILLER, Secy & Treas'r.  
GEO. B. SCOTT, Sup'l.

Mum & Co.

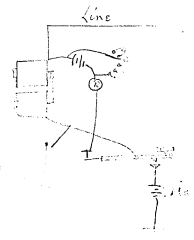
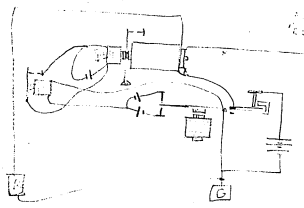
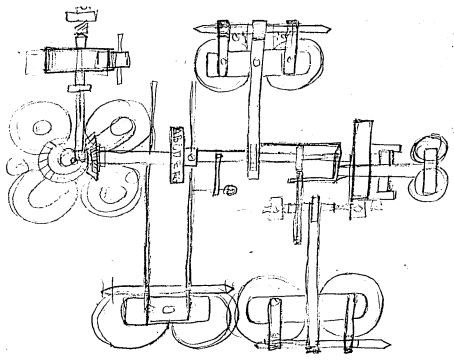
Thus,

Please mention in case no. 1. a slight alteration



also mention that an extra front panel  
may be used instead of back panel  
and when the main circuit was  
closed the local compensating magnet  
to cut off also that

The compensating magnet X. is split a local current  
constantly circulating in one helix. The other coil  
is inserted into an artificial line. The current of <sup>30-</sup>(3)  
which is opposed to the local G. ---

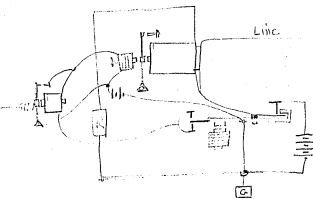


31

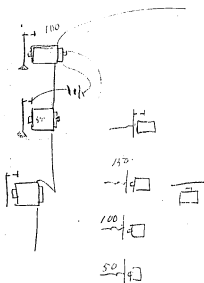


(A) - 1E

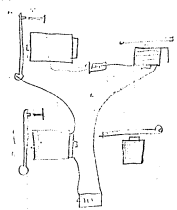
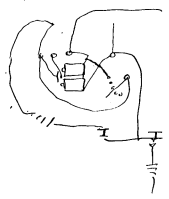
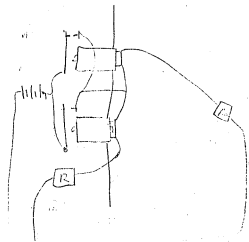
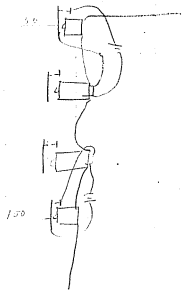
Notes



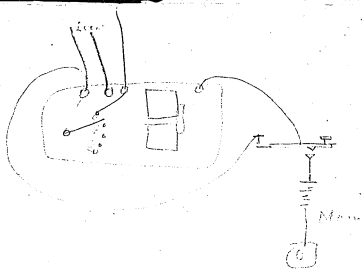
heavy westerly winds that prevailed during the winter would have blown the antenna pole & supports out of alignment to have had the lead east of building as shown



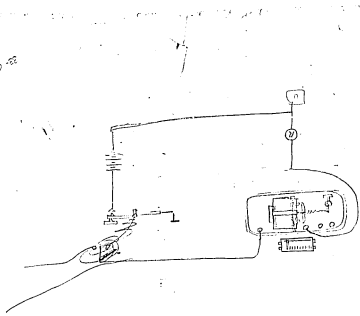
31 (A)



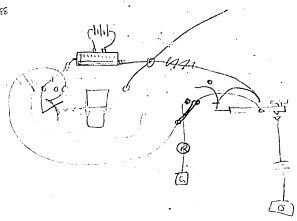
(D) 22

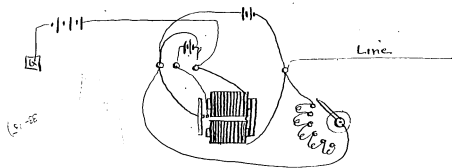
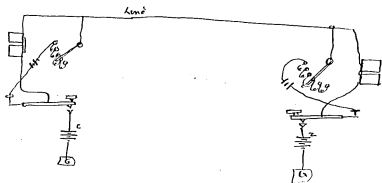


(E) 22



(E) 22



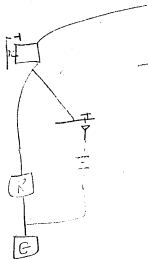




It may be done in a great number of ways. The only objection this plan has is that it will require a considerable compensating battery at times when the surge is strong, but I consider this better than an extra coil which will increase the discharge from the Relay while this mode entirely prevents the discharge current going on the line ~~in any direction~~

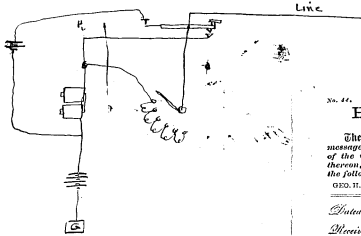
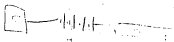
34-3)

34



34-4)

65-112



No. 11.

### HALF RATE MESSAGES.

The Western Union Telegraph Company require that all messages received for transmission shall be written on the blanks of the Company, under and subject to the conditions printed thereon, which conditions have been agreed to by the sender of the following **HALF RATE MESSAGE**

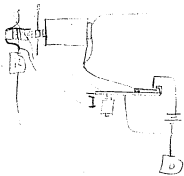
GEO. H. MUMFORD, Sec'y.

WILLIAM ORTON, Pres't.

Dated, \_\_\_\_\_ 1872.

Received at 145 Broadway,

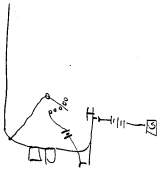
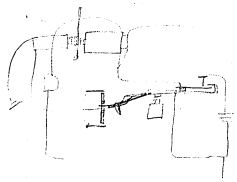
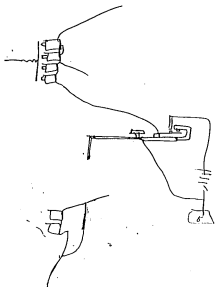
St. \_\_\_\_\_



# 34

WASSEM TELETYPE

The following is a description of the circuit of the  
WASSEM teleprinter. The circuit is a simple  
one and is of the type used in many  
other teleprinter circuits.



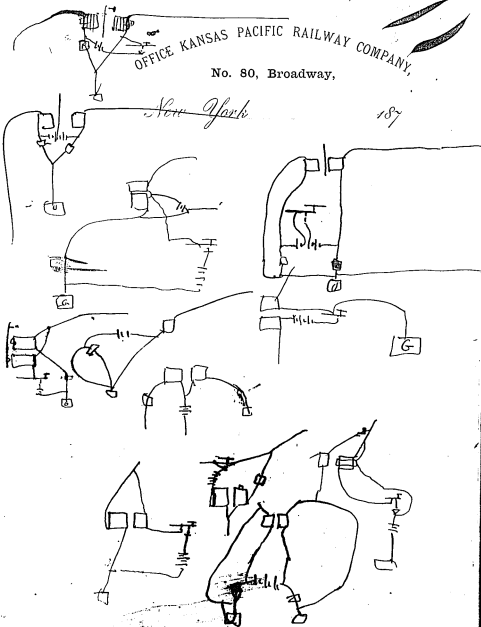
3-5

OFFICE KANSAS PACIFIC RAILWAY COMPANY,

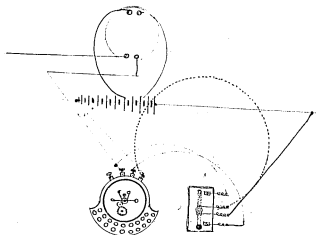
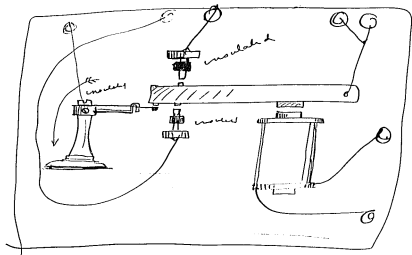
No. 80, Broadway,

*New York*

187

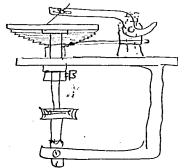
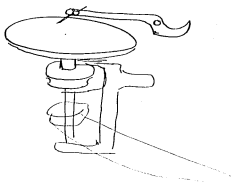




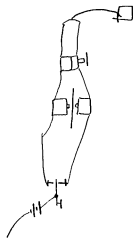
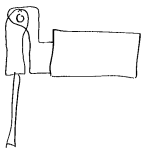


July 10 1872

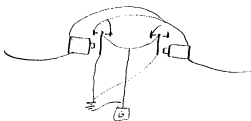
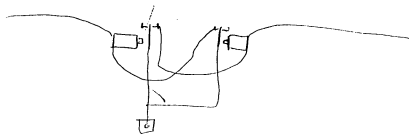
*Shaw's  
Shaw & Co*



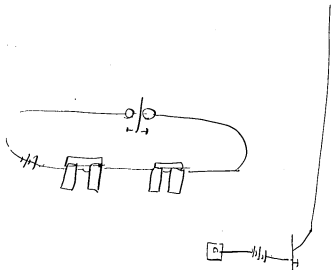
36

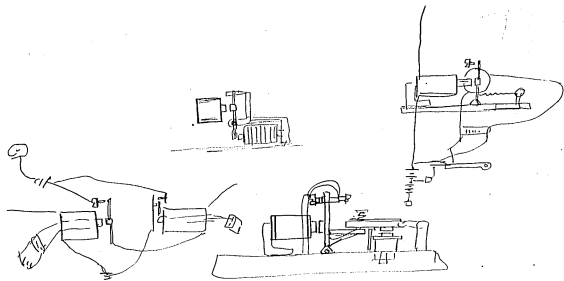


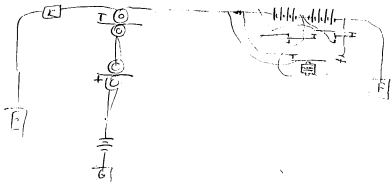
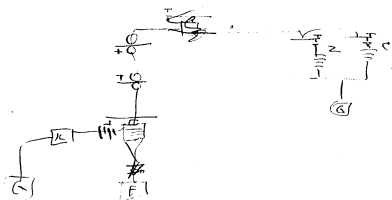
36



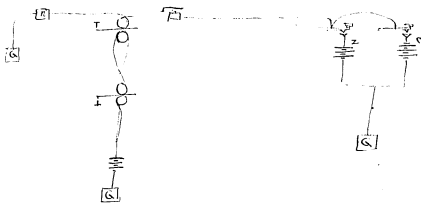
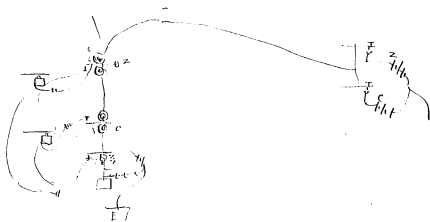
**36**



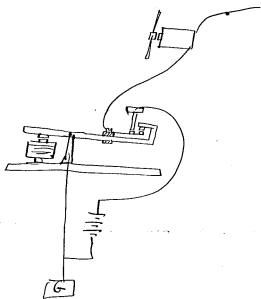




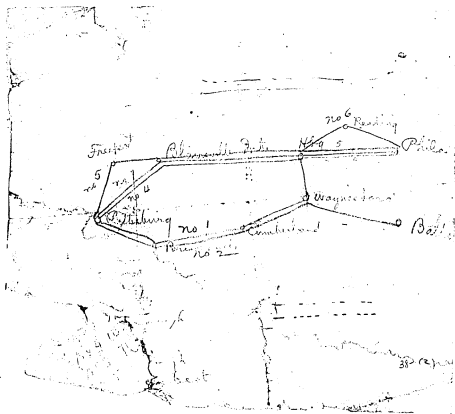
37-21

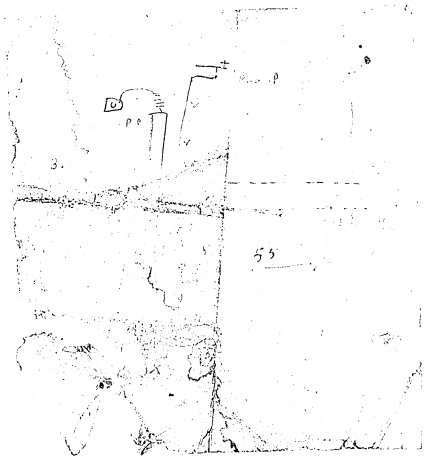
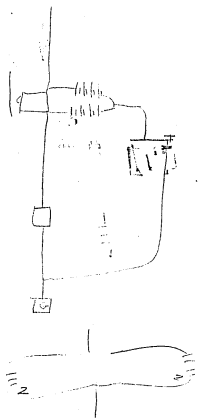






38-4)





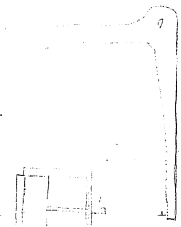
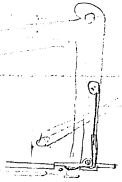
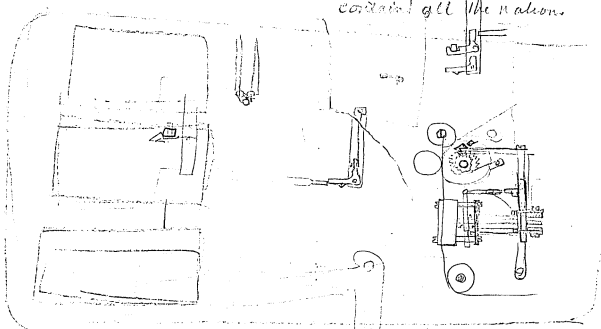
The extension of type  
 wheel cover is on a  
 kind of a - kept in a  
 perpendicular position  
 by a spring which is  
 strong enough to  
 keep over to one the  
 elements of the wheel  
 and a jet of air from  
 the wheel will be  
 that when the wheel  
 is in the position

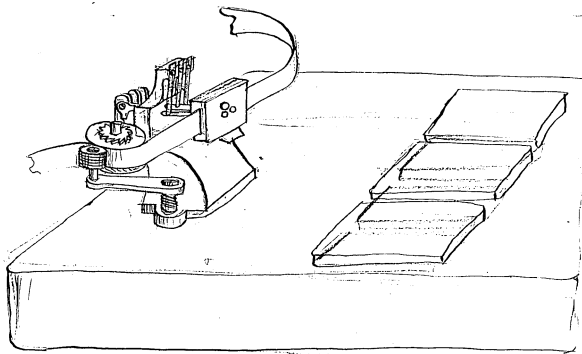
Commonness of operation  
 thus the wheel of the  
 until the wheel is  
 is not affected by a  
 points in the  
 in the wheel  
 in the wheel

The principal point  
of course is the  
general way of

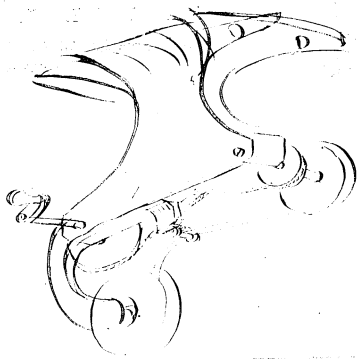
the way of  
to do it at all  
any way

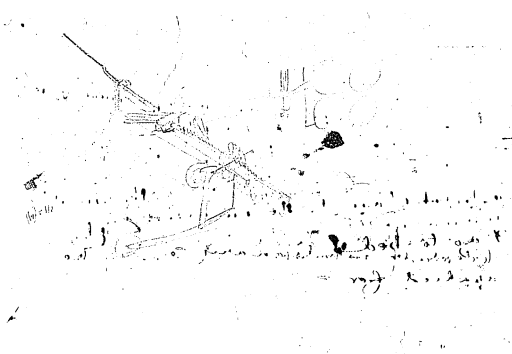
All these Complex actions  
Social paradoxes etc  
Can all be explained by the  
investigator in the laboratory  
control of the nation.





3-14





OFFICE OF  
**Newark Telegraph Works,**

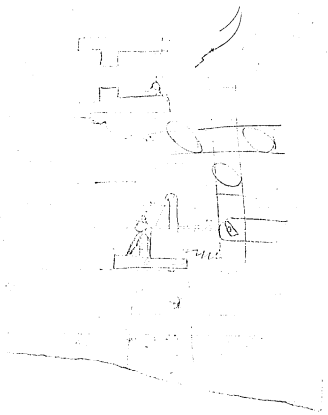
No. 15 RAILROAD AVENUE.

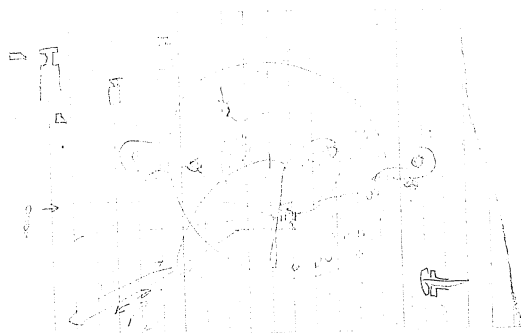
WILLIAM URSCH,  
 Y. A. ENGINEER.

Opposite Market Street Depot.

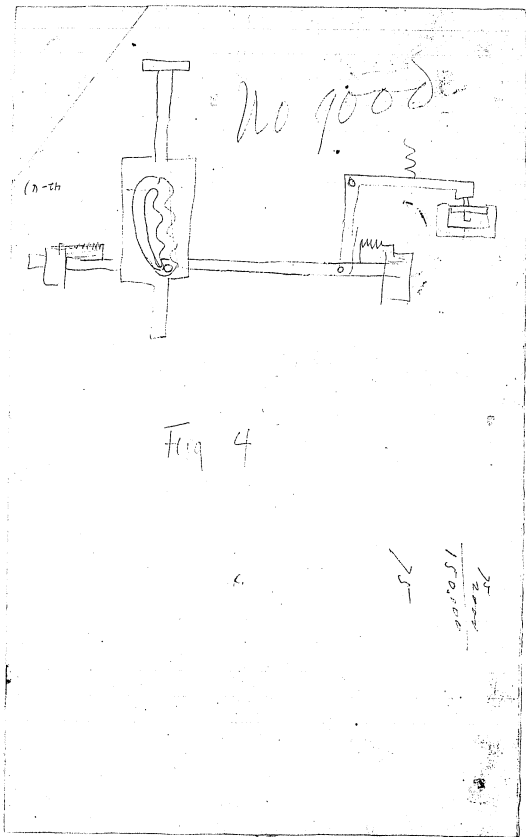
Newark, N. J. \_\_\_\_\_ 187

6-11



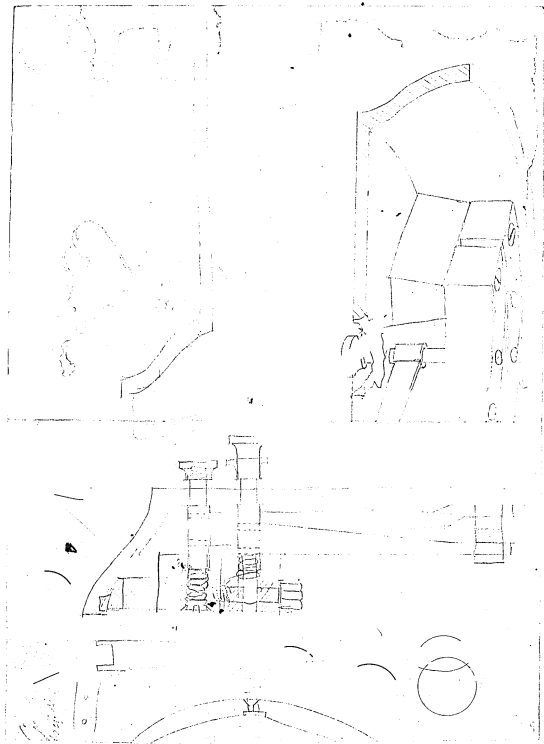




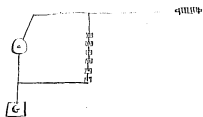
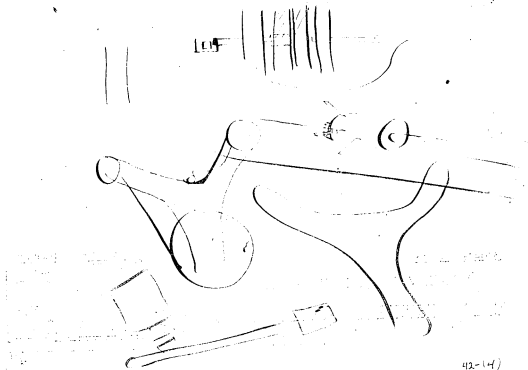




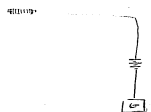
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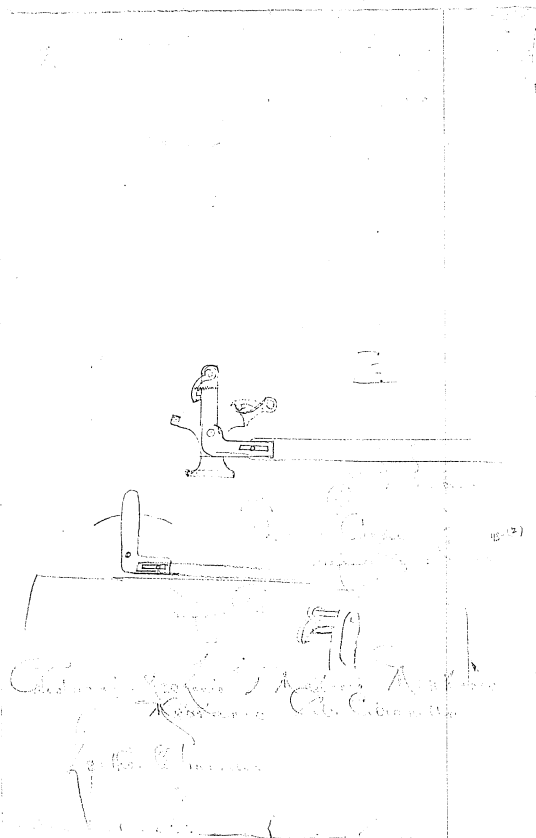


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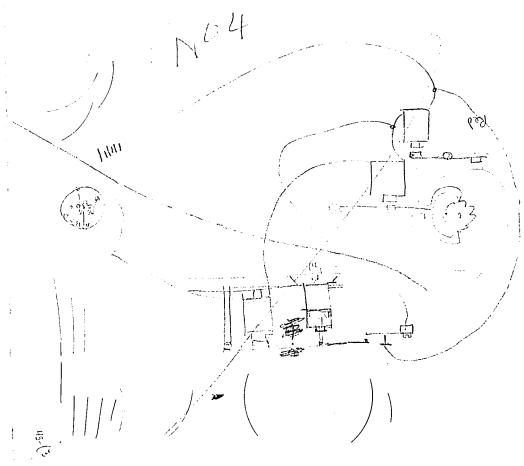


42-13





Il y a une tour à l'ouest de l'église, elle est en ruine, elle a été détruite par les allemands.



U. S. Patent Office,

OFFICIAL BUSINESS.



*Wm. D. ...*  
Chief Clerk.

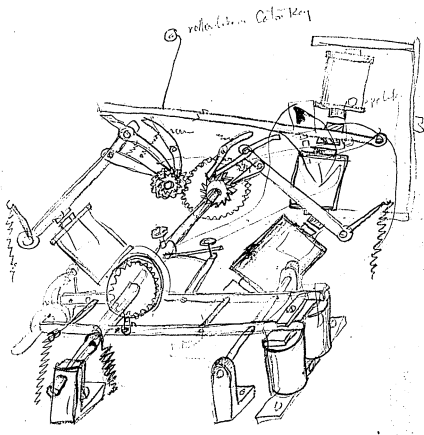
H. Scott Esq  
Care of American Telegraph Works  
113 New Jersey R.R. Avenue N.Y.C.  
Newark N.J.

New York

Mr Edison  
We have been striving  
get a satisfactory trans-  
& Receiving Instrument which  
may be adapted for general  
use that will not require  
constant adjustment or  
little liability to get out of  
order without success.

Another point. In fact  
where the speed is left to the  
judgement of the operator  
the estimates vary with the  
number of operators and  
are generally much over.  
Make an attachment of  
possible by which the  
operator can obey instructions  
with some degree of accuracy.  
Respectfully  
Yours  
G. H. ...

117 (A)



4711

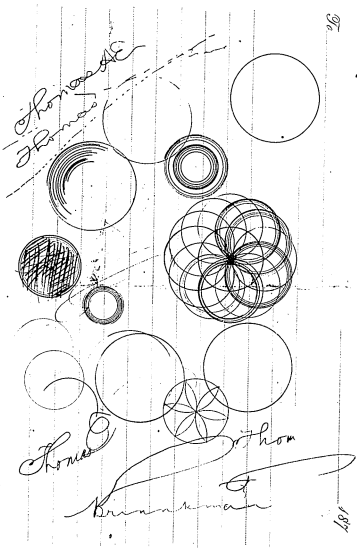


OFFICES

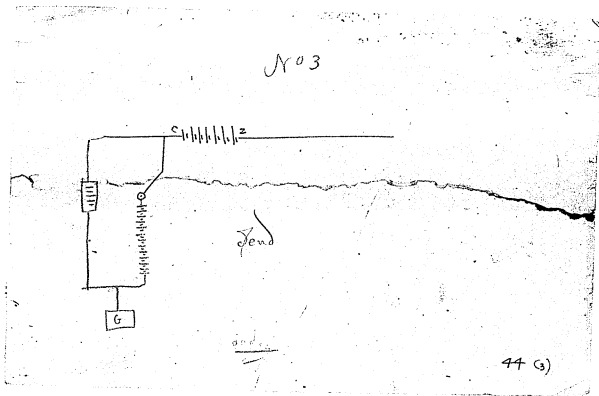
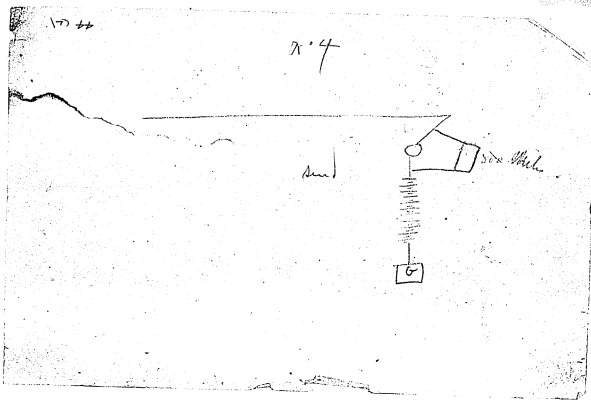
New-York: 66 BROADWAY.  
Philadelphia: 310 CHESTNUT STREET.  
Washington, D. C.: 1409 PENNSYLVANIA AVE.

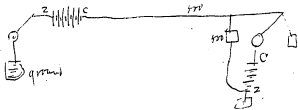


Geo. Hartington,  
President.  
J. E. Ruff,  
TREASURER.

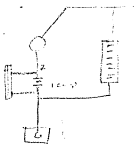


187



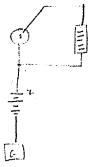


Nº 1



44 51

Nº 2



44 52



To all whom it may concern

Be it known that I Thomas A. Edison of Newark in the County of Essex and State of New Jersey having invented an improvement in means for perforating paper for telegraphing and do hereby declare the following to be a full and clear description of the same so far as perfected

Apparatus & devices for perforating paper for telegraphs

The object of this invention is to effect by simple mechanism

The perforation of paper by dots or dots & dashes for telegraphs

Fig 1 Represents a plan of the perforator arranged more especially to show its operation. E, P, P, P are bars of steel having their ends hardened so as to enter the die plate, D, and perforate an punch hole through the paper which passes between the guide plate, G, and the die plate, D. These punch bars are arranged in such a manner that they will punch holes in the paper in two lines one above the other. 5, bars being on top and 4, bars being places beneath but exactly opposite the spaces between the top bars after these bars entered the die and perforated the paper or as many of them as is necessary to form a letter they may be withdrawn by means of springs attached to the end of each bar at H, or may be brought back by a cam ~~it~~ combined with the punches and operated by the downward movement of the key (see fig 15) the latter is preferable as the tension of the springs are dispensed with and the device is made positive I do not wish to confine myself to any particular device for bringing the punches back as it may be done by ~~any~~ ~~means~~ ~~or~~ ~~with~~ weight etc. R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> are keys having upon their top end an L shaped cam and upon their lower end a slot cam within which works pins attached to the paper driving bar. The upon this punch bars are pins from the punch bars arranged so that when a key is depressed one of the bars B

will be carried forward by the skewed cam track will carry as many of the upper & lower bars as their arcs join from them for illustration the bar B, B, has a join from the bars from the one under with it from C, C, C, C, now when the bar B, B' carried forward it takes these punch bars with it leaving the others to remain in their position then the letter B is made thus



if now the bar B, B' is carried forward the letter L is made thus



and so on through the whole alphabet the keys K, K, K, K when in their normal driving position are high enough to take the pins upon the bar B, out of all the cam slots upon the keys and this bar is free to move forward when any key is depressed as the pin under such key enters the slots & the rod is thrown forward a different distance according to the pitch of the cam if a long letter having a great number of dots or dashes is to be made the slot has such a pitch as will feed that length of paper

Fig 2 shows how the pins are arranged upon the punch bars

Fig 3 shows a key K<sup>4</sup> with the upper cam arranged to move the arm G and two punch bars P, P' when the key is depressed the arm G is thrown forward by the cam K<sup>5</sup> but when it revolves

The top of the cam the springs X X' pull the punch bars back and the bar at the same time the bar is then between the key and the cam projection (1c) inside the cam and the key is free to move up the bar G - passing down the inside of the cam and spring forward when the key is up by the spring S ready to be thrown forward again by the depression of the key I don't wish to confine my self to a cam that's any particular shape or form of cam for it can be done by levers

Fig 4 represents a number of keys arranged with the punch bars and paper driving shaft

Fig 5 shows the manner in which two rows of keys could be arranged instead of one row which is desirable on account of compaction

it is not necessary that each particular key should have a slot cam upon its lower end which by its downward motion allows the pin to enter the slot and give a forward movement to the shaft as the paper driving shaft may be of flat steel and 26 slots milled or cut on one side of it thus

and the pins placed upon the keys instead of being placed upon the shaft when constructed in this form it is much more reliable & cheaper in construction when two rows of keys are used ~~there is~~  
there is employed two pieces of steel

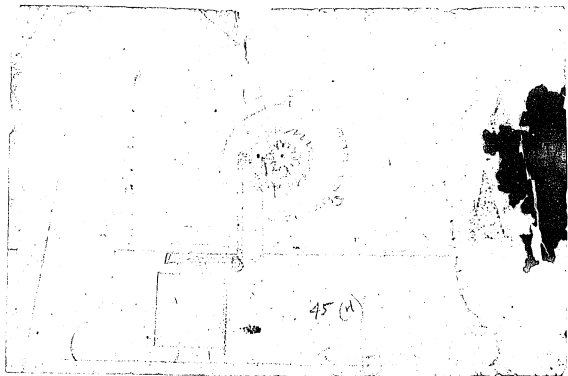


fastened together and cams milled in each bar on opposite sides  
one peculiarity about this slot cam motion for driving the paper  
bar is that when the keys are not operated upon in either the  
former or latter plan the paper driving bar is unlocked (i.e.) free  
to move forward. But when a key is depressed the pin enters slot  
locks it and gives it a forward & back motion which is a positive  
movement very necessary in punching telegraph characters which  
can only be read when they are accurately spaced.

Fig 6 Represents the paper driving device. G is a gear which  
is connected to work the gear wheel, S.  
or fine mill

N is a ratchet or fine milled wheel connected to the gear  
wheel G and shaft C. R', R are hard vulcanite rubber rollers  
running upon the steel wheels X, X' which are milled or roughened. The  
paper passes between the rubber rollers R, R' and the wheels X, X'.  
Shaft carrying G the rubber is held down tightly upon the  
paper by means of a spring. L is a bar with a slot at one end  
pivoted loosely upon the shaft G. Near the middle is a dog  
D held held in the path of the ratchet wheel N by the spring  
A - K is a stop screw to lock the dog D, and ratchet wheel N,  
at that point and prevent the momentum of the gear wheels etc  
from carrying it a greater distance.

C is a click to prevent the wheel from coming back upon the end  
of the driving shaft. ~~of any lever from~~ that shaft is a pin working  
in a slot upon the bar L and gives motion to this bar when at rest  
the dog D is locked with the ratchet wheel N & stop screw K.



45

Caseah,

The object of this invention is preventing a ~~number~~<sup>number</sup> of printing machines on the same circuit, or circuits from working & printing except the desired machine. (A) to ~~be~~<sup>be</sup> used by

This invention consists in an attachment to one of my printing machines already patented. This attachment is merely transferring the lock wheel from ~~position~~<sup>position</sup> & is a little nearer the letter wheel and dispenses with the X. piece and placing a straight piece instead. The printing lever is provided with a pin, having a V notch end in the top of it, so that when the type wheel is shifted to the left the straight pin passes through the slots in the lock wheel, and this lock wheel is thrown directly over the pin on the printing lever so that the lock wheel ~~cannot~~<sup>cannot</sup> prevent the printing lever from moving as long as it remains shifted to the left, and as there were only one position where it can set back and forward it follows that if these positions are never brought together to shift that no printing will take place. Now if there were 30 machines in Circuit, each provided with the lock wheel in this position but with the shifting device set in different positions on every machine, and no shifting ~~could~~<sup>could</sup> take place except by bringing the desired <sup>shifts of device</sup> machine, in correct position ~~the~~ closing the type wheel about the pin the printing lever, it follows that

(2)

Every machine would shift to the left and the Printing Lever remain locked, except the desired Machine which would shift to the left and thus bring the type wheel over the face and hence kept there as long as desired. I mention here that no shifting can take place except the type wheel wheel is closed with the type wheel never taking place at the printing, but only when a particular Machine is to be brought into action. Hence when a type wheel is being used no other can get shifted to the right by the action of the printing lever except by ~~accidental~~ closing both circuits at once but this can be avoided in the transmitter.

~~I will also mention here that I do not use~~  
If I have enough decided matter in the Printing Lever when it is locked to through up the Union. I do not wish to Confine myself to any particular device but claim locking the printing lever by a mechanism operated by that lever and controlled by the Type wheel, or vice versa. I will mention here that there are several modes of performing this same operation, one of which is to have a separate magnet working a ratchet wheel which ratchet will have a

My claims will probably be

1<sup>st</sup> The formation of Morse dots and dashes by perforating up two lines ~~with~~ for purpose set forth

2<sup>nd</sup> The combination die or dies and punches arranged in the manner described, two <sup>or more</sup> lines, and operated

3<sup>rd</sup> The combination of the punch bars <sup>C C' C" C'"</sup> with ~~the~~ bars <sup>Fig 1</sup> B' B' BB & BB'. And Key or Keys <sup>K' K' K' K'</sup> operated or their equivalents for the purpose set forth

4<sup>th</sup> The paper drawing bar <sup>or its equivalent</sup> ~~or bars~~ <sup>or bars</sup> operated as described for purpose set forth i. (Fig 1)

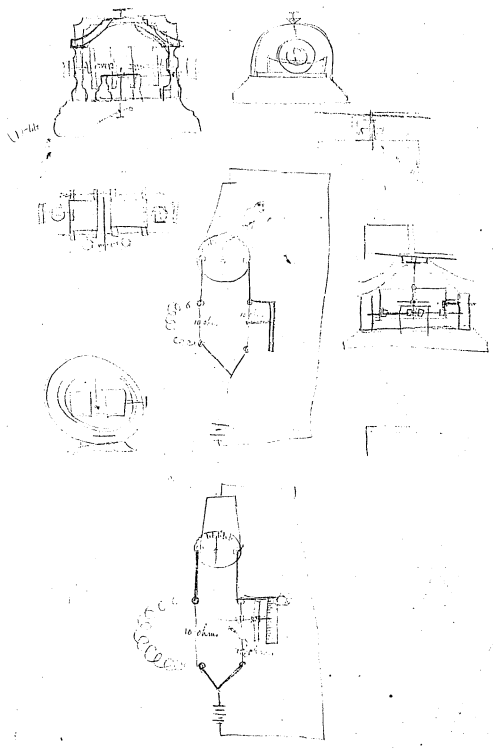
5<sup>th</sup> The device C. E. F. X or its equivalent for drawing the punch bars out of the punches for the purpose set forth -

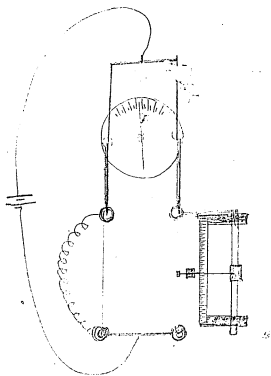
6<sup>th</sup> The bars ~~or~~ springs <sup>or their equivalents</sup> in combination with the bars B' B' BB & BB' for the purpose set forth =

7<sup>th</sup> The Combination of the punches having their Cutting Edges made as described with the other mechanism for the purpose set forth fig 46 47 48 49

8<sup>th</sup> The Combination of the Embossing plate <sup>Fig 40</sup> + bars with the letters B' B' BB etc <sup>Fig 1</sup> for the purpose set forth

46-2

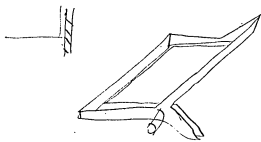
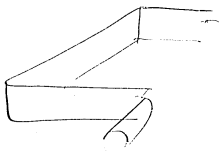


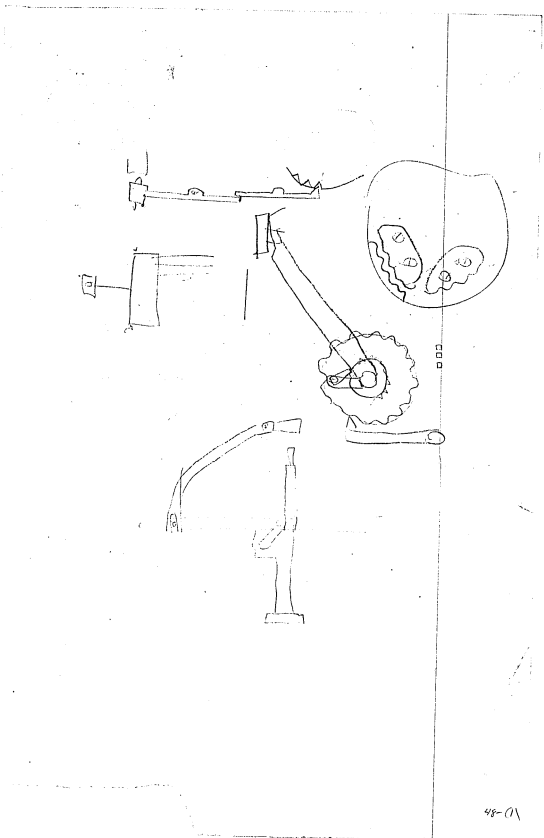




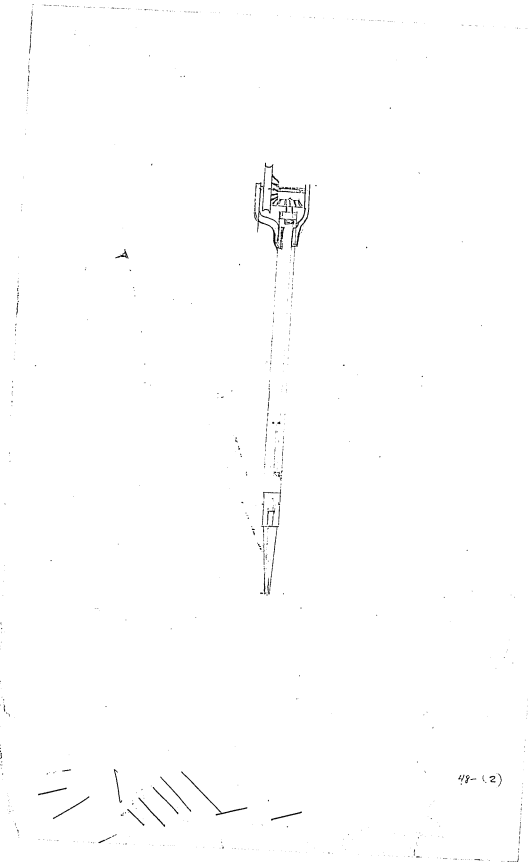


150-11





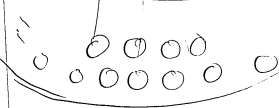
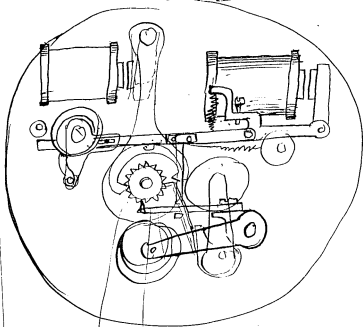
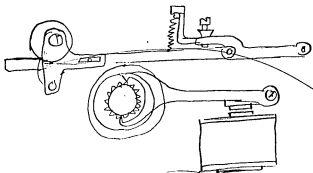
48-01



48-(2)



(5 - 2)



. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 4

oo oo oo oooooo oo oooooo oo oo oo

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 4

oo ooo ooo oooo ooo ooo ooo ooo

o



96

(10) 20

STANDARD INDUSTRIAL EQUIPMENT CO.

STANDARD INDUSTRIAL EQUIPMENT CO.  
1000 W. 10th St.  
CINCINNATI, OHIO



1  
2  
3  
4  
5  
6  
7  
8  
9  
10



51-(3)

Newark, N. J. .... 187

M.....

ELECTRO-MAGNETIC  
And Magneto-Electric  
**MACHINERY,**  
Philosophical & Experimental Apparatus,  
GALVANOMETERS,  
Rheostats, Batteries, Chemical Apparatus,  
AND TELEGRAPH SUPPLIES.

WM. UNGER. T. A. EDISON.

*Depts. of* THE NEWARK TELEGRAPH WORKS,

No. 15 RAILROAD AVENUE,

NEWARK.



Escapements owned or controlled by Gold & Slock Telegraph Company. Patented and to be Patented -

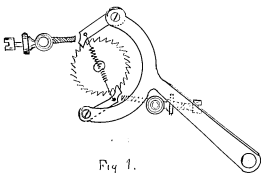


Fig 1 represents the Escapement upon the Boston Instrument. Not shown or described in the drawings or specifications. It is Patented in Pope & Edison's Patent upon working upon one wire by rapid vibrations and a Polarized Printing Magnet, but in an opposite form the clicks pulling and are formed thus

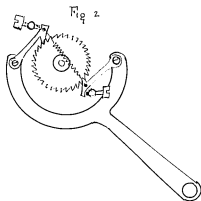
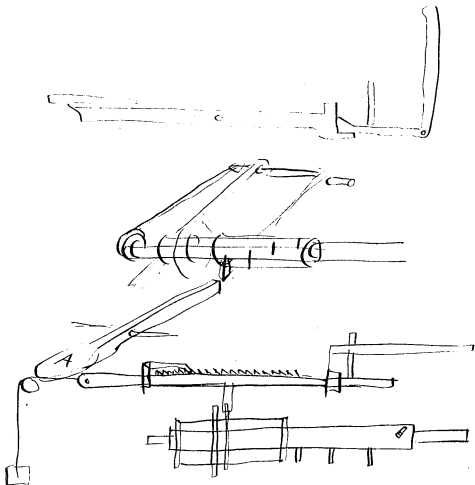


Fig 2 will cover both escapements, there are a great many modifications faulted upon the exterior lock principle all of which according to patent law are patentable among the modifications is that represented by Fig 3 - - - -

(1) - 55 OFFICE OF THE  
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NEWARK, N. J.

Newark, N. J., ..... 187



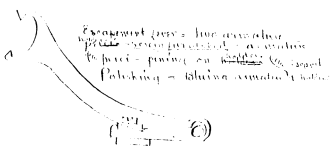
(2) - 75

Rice work schedule.

norm - pre, match, drill, plate, polished =



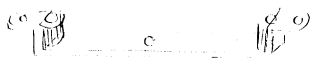
40  
65  
5  
95  
315%



10 per day.

65°

Examination, Milling, -

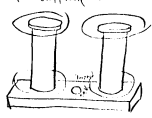


20 per day.

each

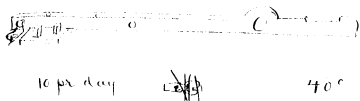
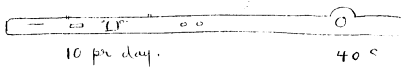
5°

Examination, Drilling, pulling all over speak on - rubber beads, examination, Drilling -

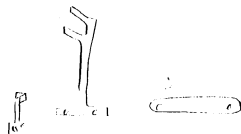


10 per day =

45°



total  
 40  
 40  
 15  
 40  
 175.



10 per day

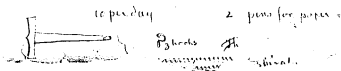
40°

assembling paper knife & quipping, soldering  
 on shafts =

15°

10 per day -

52(3)



*Blind*

*17*

*18*

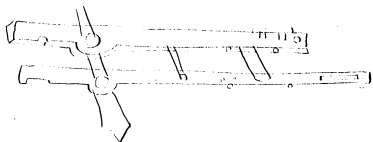
*19*

*20*

*21*

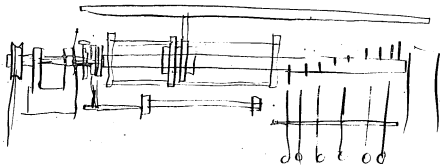
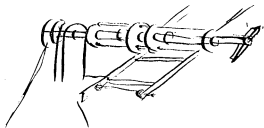
*22*

6

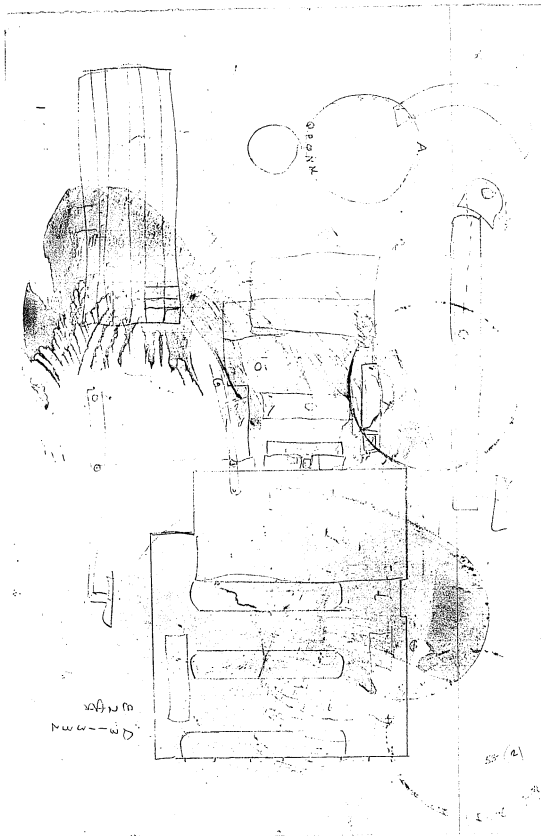


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AMERICAN TELEGRAPH WORKS.  
No. 103 NEW JERSEY RAILROAD AVE.,  
NEWARK, N. J.

Newark, N. J., July 12, 1871

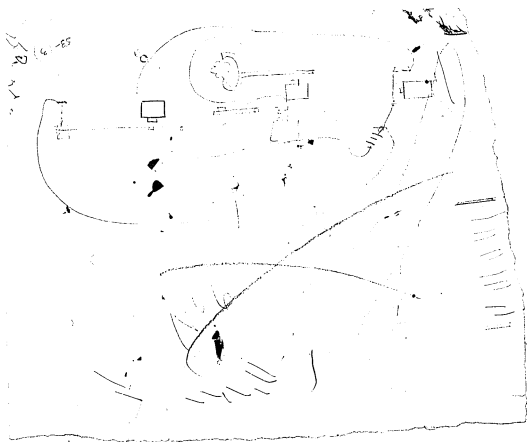


3,200

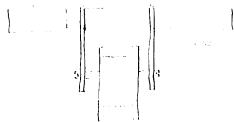






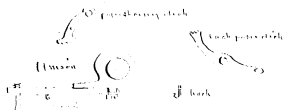


3 Blowers: 2 rows - shaft for cut roller and stems - cut roller  
 cloth on 3/4" - put on 10 per day 50°



Total

58°  
 6°  
 10°  
 10°  
 30°  
 65°  
 37°



10 per day.

65°

Planing frames 10 pairs 10°

Planing edges frames sides, polishing, putting in slats 10 pairs \$100.

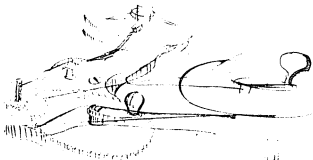
Grilling & taping 10 pairs frames 30°



65°

54-1)

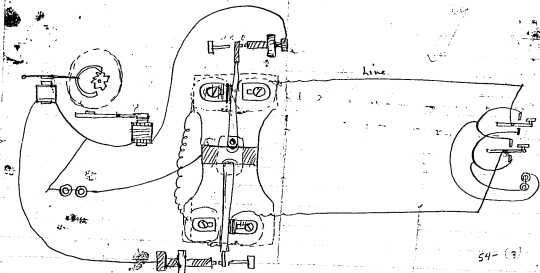
(2) -LS



MEMORANDUM.

Rem. Marks

1371



BLANK No. 1.

OFFICE:  
Philadelphia,  
in Charge.

142 N. 2<sup>nd</sup> St. & York,  
NEW YORK.

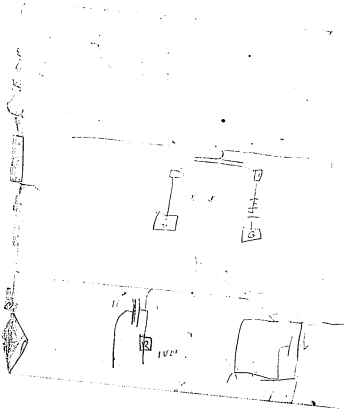


OFFICE:  
Washington, D. C.  
125 Penn. Av.

NEW HANOVER, PA., N. A.  
NEW YORK.

1887

*Blank*  
No.



BLANK No. 1.

OFFICE:  
Philadelphia,  
in receipt

RECEIVED AT THE OFFICE OF

of

BY BROK'DWAY

New York

The Automatic Telegraph Co.

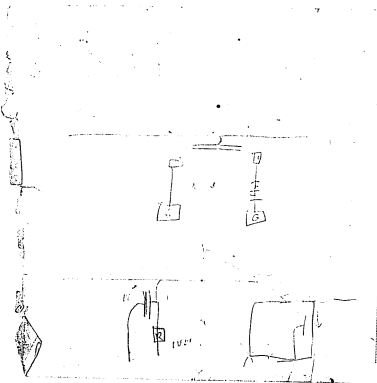
OFFICE:  
Washington, D. C.  
1877

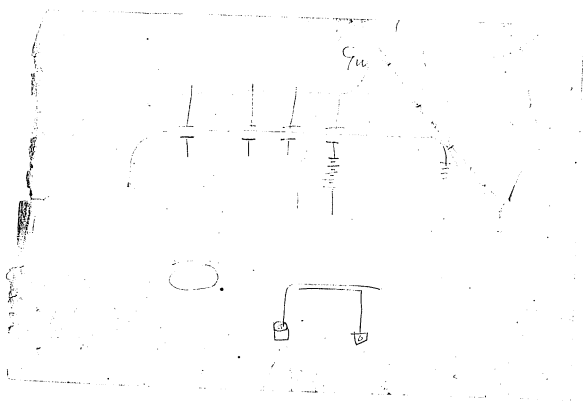
GEN. MANAGER, J. H. ...  
NEW YORK

J. C. MERT, Sec. & Treas.  
NEW YORK

1877

Ordered







Turning out type caskets.

50°

Filing type caskets.

50°

Polishing type caskets.

25°

50

50

2.5

4.0

7.5

11

2.5°



4.0°



1/2" 1/2"

7.5°

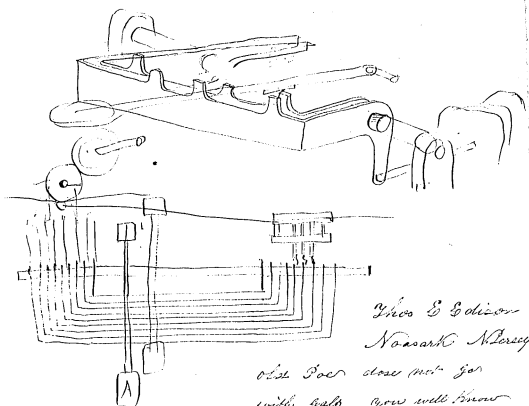


Back of shaft of stems  
soldering type caskets.

4.0°

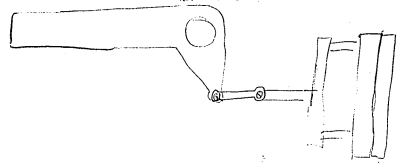
ss (2)

(6) -55

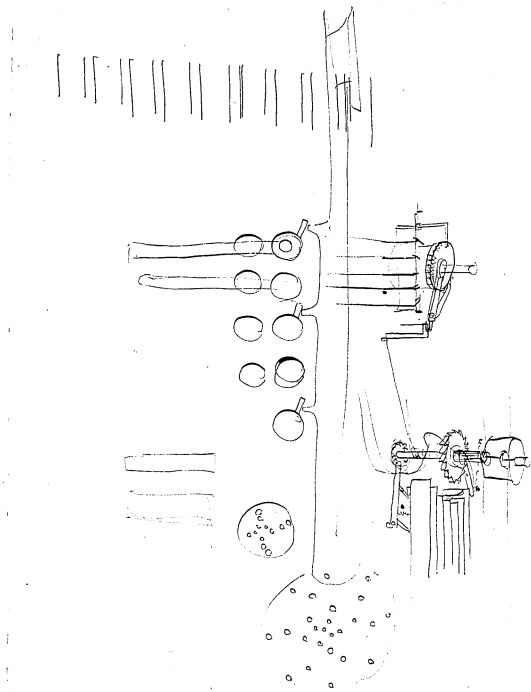


Thos E Edison  
Newark N Jersey

Ohst Soc does not go  
with gals you will know  
it is so .







(1) -95

Fig 1

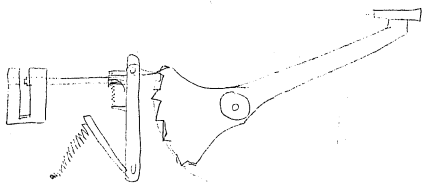
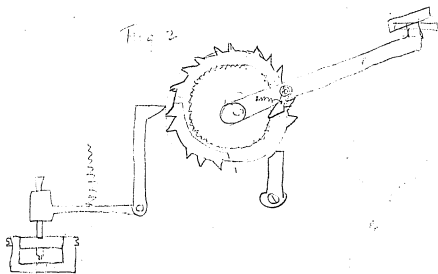
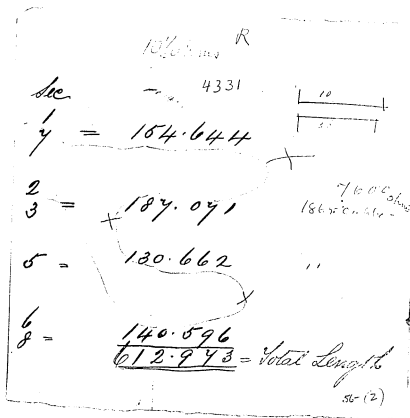
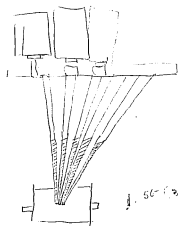
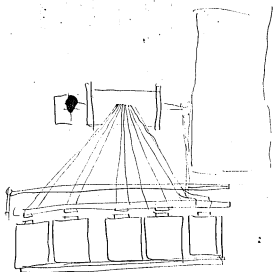


Fig 2

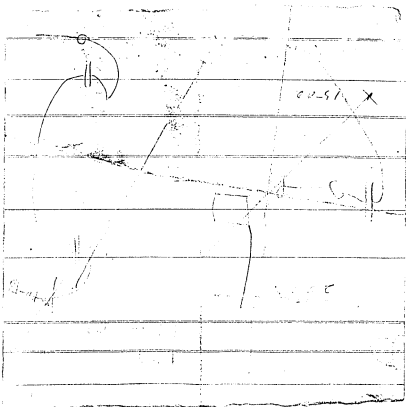


P. 56



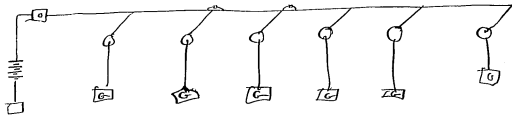
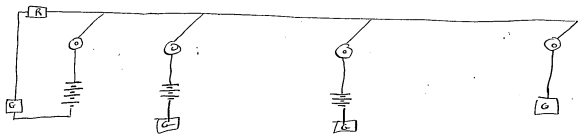


Dec 10 1871

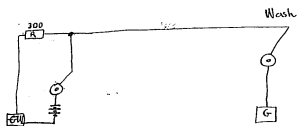




56-4



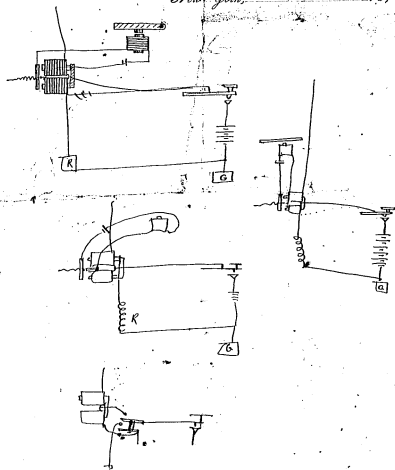
∴



Automatic Telegraph Company,

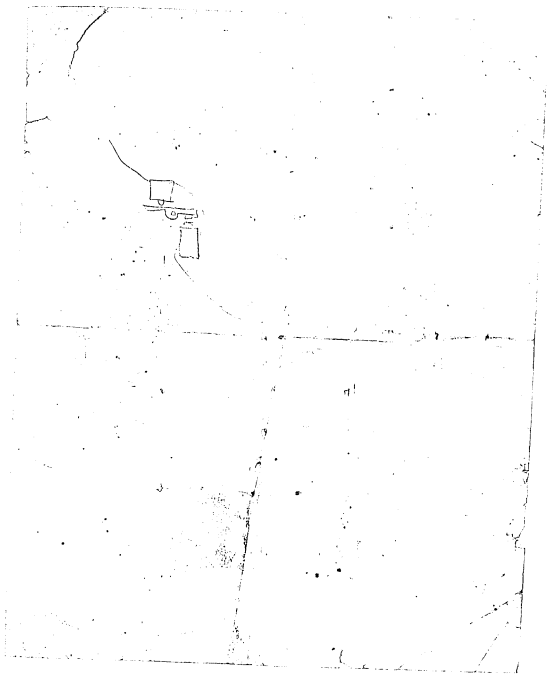
80 BROADWAY, ROOM 30.

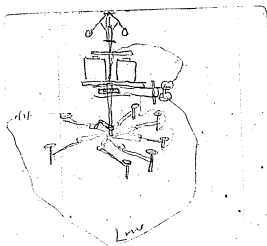
New York, 1877



57 (2)



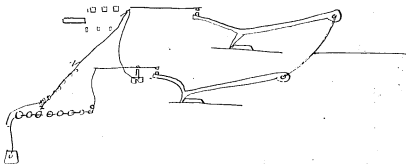
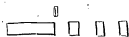
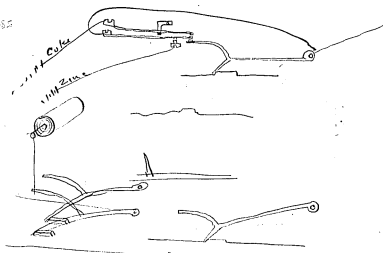




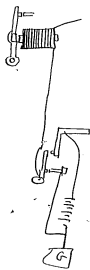
An electric engine provided with  
 a governor which automatically  
 governs the speed with which  
 the shaft is driven, on this shaft  
 is a fly wheel which by the side of  
 the fly wheel is a  
 small fly wheel also providing

58 (1)

(2) 55



58



58

lever operated by a magnet  
or by any other force  
controlled by magnetism  
is adjacent to the type  
wheel -

On the extreme end of  
the Engine shaft of an arm  
on the end of this arm is  
a Coiled spring  
3 Pound Rubber piece  
with 30 plates mounted  
with each other in a  
substance like the  
and 2 fingers. Key  
touches each plate  
The contact spring on the  
arm of the Engine shaft  
touches each plate as  
the shaft makes a  
Revolution

OFFICES:

New-York:  
66 BROADWAY.

Philadelphia:

310 CHESTNUT STREET.

Washington, D. C.:

1409 PENNSYLVANIA AVE.

*Tc*



Geo. Harrington,  
PRESIDENT.

J. C. Reiff,  
THEATRE.

187

58

E-1719  
P. 59

List of articles to be manufactured by Scientific Toy Co. - with prices.			
Sewing Machine for Little Girls	2.00	Air Pump	2.00
Magneto-electric-shocking Machine	2.00	Spectroscope	3.00
Induction coil for "	2.00	Electric-Bell.	1.00
Magnetic Engine. with battery	1.50	Lathe.	5.00
Magnetic Locomotive with track	2.00	Planer.	5.00.
Printing Telegraph Machine.	2.00	Drill Press	3.00
Printing Press	3.00	Steam Engine	1.00
Printing Case of Types	5.00	Caloric "	1.50
Printing Machine.	1.00	Gas Engine	1.50
Microscope	2.00	Kalidoscop	50
Galvanometer	1.00.	Turbine Wheel	1.50
Gas Making Machine	4.00.	Fire Engine	1.50-
Loom for weaving.	4.00	Lithograph Press.	5.00.
Band Saw.	3.00.	Electric Steam Boat	3.00.

20,000.

10,000

59- (1)

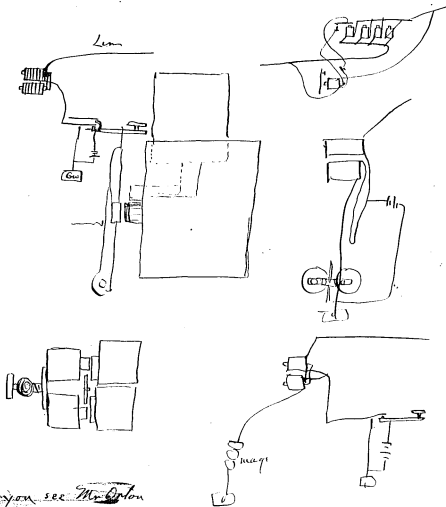
The Gold and Stock Telegraph Co.,

Executive Offices,

No. 61 Broadway, New York.

New York, .....187

MARSHALL LEFFERTS, President.  
 JOSEPH M. COOK, Vice Pres't.  
 NORMAN C. MILLER, Sec'y & Treas'r.  
 GEO. B. SCOTT, Sup't.



*Refer to see Mr. Eaton  
 at the ...*

57- (M)

The Gold and Stock Telegraph Co.,

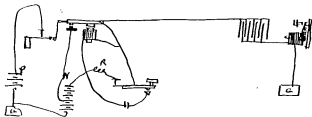
Executive Offices,

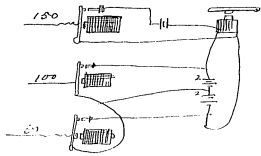
No. 61 Broadway, New York.

New York, .....187

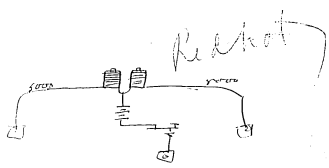
MARSHALL LEFFERTS, President.  
 JOSEPH M. COOK, Vice Pres't.  
 NORMAN C. MILLER, Sec'y & Treas'r.  
 GEO. B. SCOTT, Sup't.

59





100

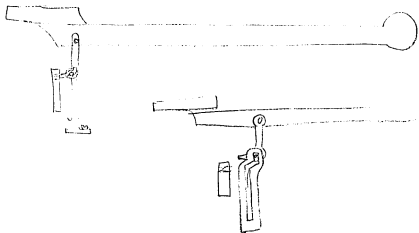


60-1

(2)-99

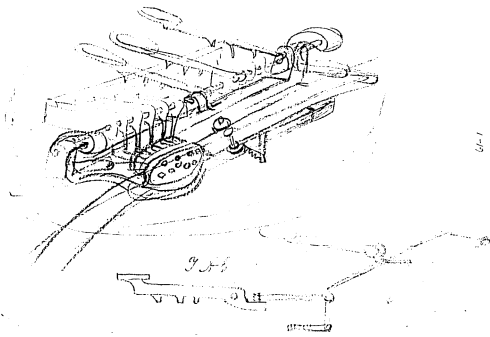
4600,

4,500 40,000  
6 700 40,000  
7000. 700000



(The <sup>of</sup> Potassium )  
 Soluble Salts of Potassium  
 Potassium of low <sup>soluble</sup> Salts of Potassium  
 Non Soluble of Potassium  
 Non Soluble  
 Non Soluble of Potassium  
 Potassium this is a specimen of the Potassium of  
 Potassium a specimen of the Potassium  
 This is a specimen of the Potassium

This is a specimen of the Potassium  
 Potassium on the  
 This is a specimen of the Potassium  
 Potassium on the





Bools, actual value, not cost,

Finished Work, Annual Pts, actual est mfr.

Raw Stock, steel iron & brass iron for Pts

Manufacturing debts

188 102 002

17. 656. 46.

8. 644. 49.

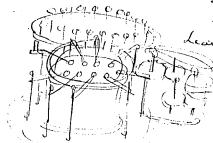
1 201. 34

2 240. 56. 29,502.45

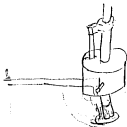
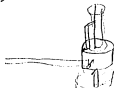
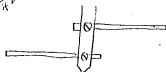
6 045. 53.

2) 23. 757. 92

11. 878. 96.



11 878.96  
 8 236.94  
 3 641.92

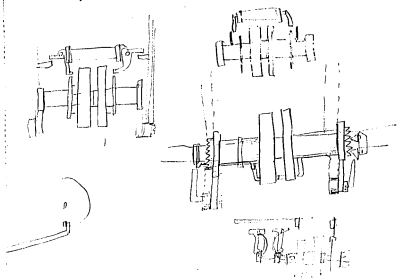


Bills to be paid.

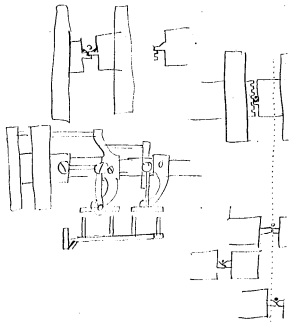
Henry	13.00	
Buss Boon	25.00	
Kernan	10.00	
Smith	154.54	
Navies	81.11	
Orden	17.92	
Kelley	53.46	
Williams & Tutin	28.00	700.
Miscellaneous	25.00	<u>100</u>

Couglas 500.00  
 95703

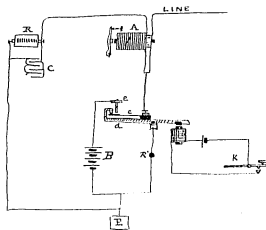
3  
 1222 00  
 8256.  
 113944  
 122200



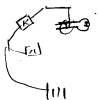
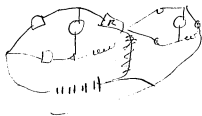
6-17



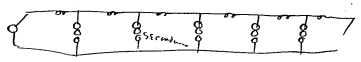
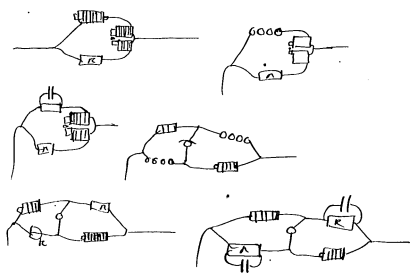
and subsequently has been adapted by Mr. Strain. Duplex telegraphy is a German invention idea but the two problems above stated essential to its success were unsolved by them. The Stearns' Combination and the one adapted upon the American telegraph lines is shown in figure 1.



A. is the Duplex relay for receiving the signals from the distant station. It has double coils wound around its cores, one coil in the circuit of the regular line and one coil in the circuit of the artificial line. The current from the battery B passes over both circuits in the same direction.

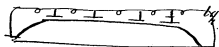
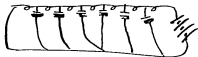
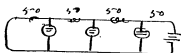
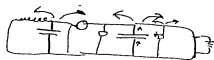


61 (2)



artificial cable with secondaries.

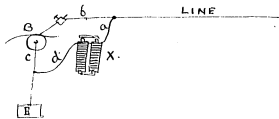
62-11



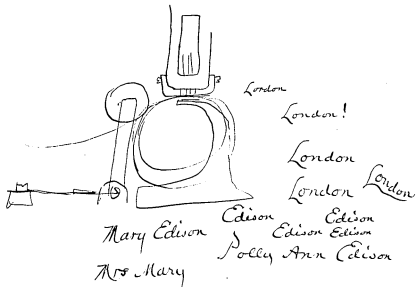
62



a submarine Cable/ generating in a small  
Compass a current equal to and  
precisely like the discharge currents  
generated on that immense Condenser  
the Atlantic Cable, an instrument  
which unlike a Condenser preserves its electric  
Continuity, I applied it to the  
Chemical Receiving instrument in  
this way



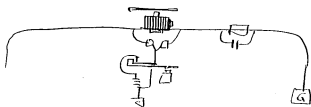
X is the long electro-magnet, placed in a  
Branch of the line a-d. R is the  
receiving inst in the other branch b.c.  
a dash comes over the wire ~~over the~~ <sup>or 31</sup>



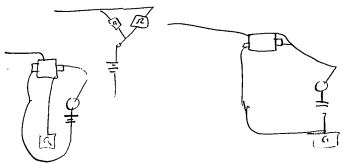
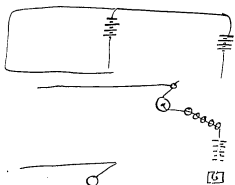
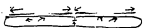
E-1719-pl 2

67-11

21.



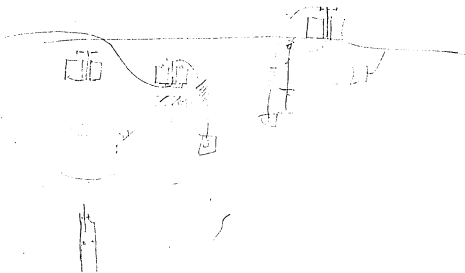
W-107



Alcang 20. 1893

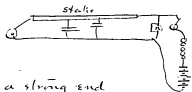


T 21

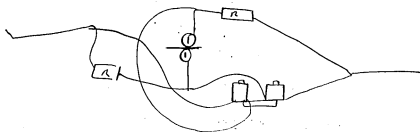


13 11

Try secondaries thus.



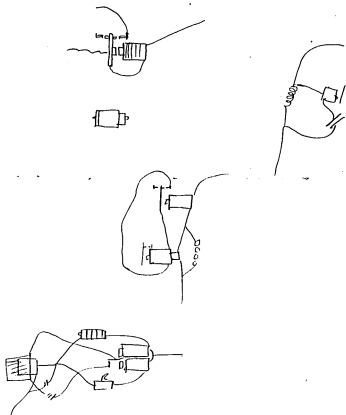
to give a string end  
with -



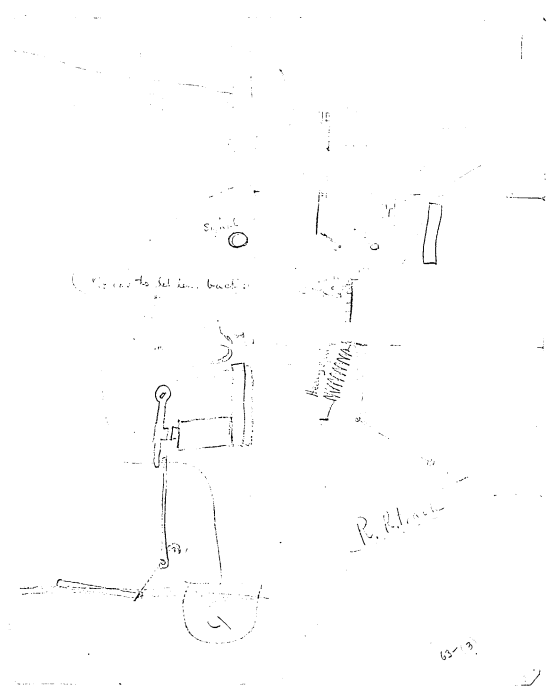
Try This

Try induction from a single layer of No 30  
on Long Compensating Magnet. Then two layers

Try which works strongest, with a given  
strength on regular Relay. a paired  
R of high or low R. Low probably  
be strongest -







JAMES PARTON

JOSEPH H. HUNNELL

CHARLES H. HARTUNG

**Patrick, Bunnell & Co.**

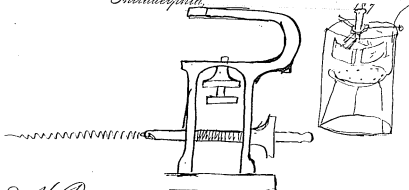
**PRACTICAL TELEGRAPHERS AND ELECTRICIANS,**

MANUFACTURERS AND DEALERS IN

*Telegraph and Electrical Instruments and Supplies,*

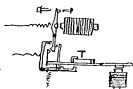
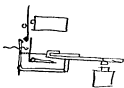
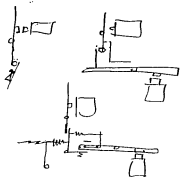
No. 38 SOUTH FOURTH STREET.

*Philadelphia,*

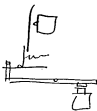
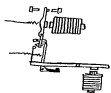
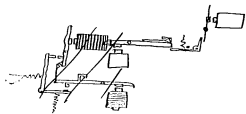


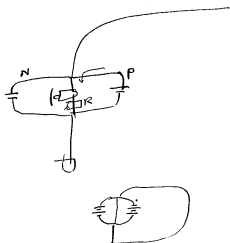
*J. H. Bunnell J. H. Bunnell*  
*J. H. Bunnell Philadelphia*  
 Thirty days after date We promise to pay  
 to the order of J. F. James & Co  
 Ten Dollars  
*Thirty*

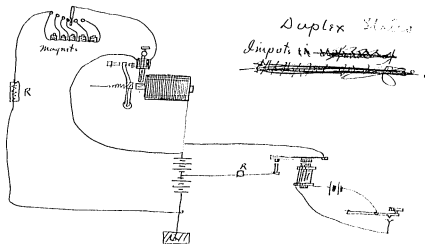
*Patrick, Bunnell & Co. Pay to the order of James & Co. Thirty Dollars & oblige same to my dr*



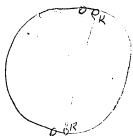
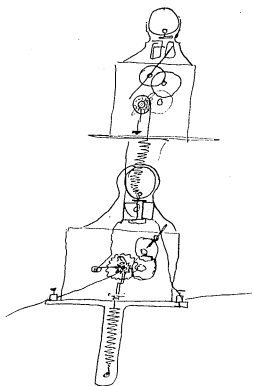
in fig —————







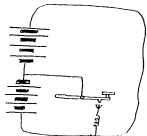
The magnets in the balancing or compensating circuit are used for the purpose of generating an after current due to the demagnetization of the iron core, which current is very powerful and by regulation made equal to the static return charge many times greater than is possible to equalize by a condenser, magnets when properly placed are the sworn enemies of static currents whether dynamic or in a muscle twisting mode,



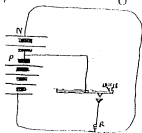
64-2

Improved method of reversing currents and  
manipulating

Throwing a battery upon a closed circuit

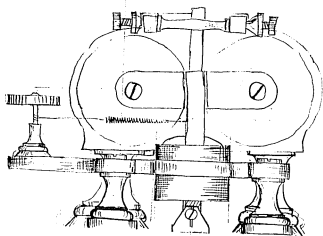


Reversing the direction of the current in a closed circuit.



64-55





The Gold and Stock Telegraph Co.,

Executive Office,

No. 61 Broadway, New York.

New York, ..... 187

MARSHALL LEFFERTS, President.  
JOSEPH M. COOK, Vice Pres't  
NORMAN C. MILLER, Sec'y & Treas'r.  
GEO. B. SACKETT, Sup't.

Get my Magnet box. get 4 Stearns condensers.  
get high resistance delicate relay. Get back spring point  
key. get some very high resistance magnets for leaks

Send 120 cup coil short out it quickly afterward to 20 cups.  
Shunt very high res sensitive relay with several relays connected  
quarterly. leak at 3 places with several high R relays and  
R coil, for change try condensers for leak.

Reverse short whip to clear only when leaks and shunt  
not used =

Try Relays in Equanting line Duplex.

Try putting relay in main Duplex and equanting for  
disturbance by putting another in Equanting Circuit.

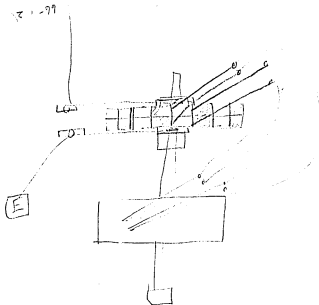
Try this

make use of Phila Apts.



15-62

to make it a part of institution,  
& they might not relish the idea  
of a speaker on some brown bag  
around them. They might prefer  
but it is the thought has made it a  
study of depression without using  
the least amount of people  
who have Brown Stew have  
& a Bank account to perform  
a certain operation might not  
John Bull be benefitted by his  
scheme in using the smallest  
number to do his work even  
if they Board in Sunday & get a  
dollar a day



get approval from General

(D-77)

$$\begin{array}{r}
 214 \\
 251 \\
 \hline
 465 \\
 195 \\
 193 \\
 100 \\
 28 \\
 \hline
 1311 \\
 362 \\
 \hline
 1673 \\
 305 \\
 \hline
 1978 \\
 \hline
 2276
 \end{array}$$

$$\begin{array}{r}
 \overset{6}{470} \\
 421 \\
 363 \\
 \hline
 302 \\
 362 \\
 \hline
 2447 \\
 362 \\
 \hline
 2809 \\
 305 \\
 \hline
 1050 \\
 795 \\
 362 \\
 305 \\
 363 \\
 \hline
 1625 \\
 421 \\
 \hline
 2246
 \end{array}$$

$$\begin{array}{r}
 19 \overline{) 426} \\
 \underline{38} \\
 46 \\
 \underline{38} \\
 8
 \end{array}$$

$$\begin{array}{r}
 3 \overline{) 410} \\
 \underline{300} \\
 110 \\
 \underline{90} \\
 20
 \end{array}$$

5) 8000  
 13 5 7 7 11 13 15 17 19

$$\begin{array}{r}
 5 \overline{) 8000} \\
 \underline{1600}
 \end{array}$$

$$\begin{array}{r}
 5 \overline{) 1600} \\
 \underline{320}
 \end{array}$$

$$\begin{array}{r}
 3 \overline{) 9000} \\
 \underline{3000} \\
 3000 \\
 \underline{1000}
 \end{array}$$

193

973

13) 5-38. (41)

$$\begin{array}{r} 52 \\ 18 \\ \hline 13 \\ 5 \end{array}$$

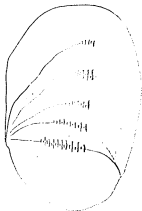
$$\begin{array}{r} 13 \\ 13 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 13 \\ 169 \\ \hline 6 \\ 172 \end{array}$$

$$\begin{array}{r} 538 \\ 175 \\ \hline 363 \end{array}$$

$$\begin{array}{r} 307 \\ 175 \\ \hline 132 \end{array}$$

$$\begin{array}{r} 63 \\ 40 \\ \hline 103 \\ 214 \end{array}$$

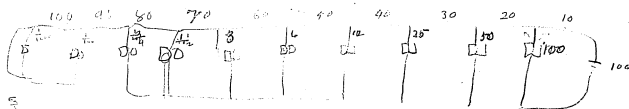
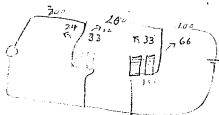


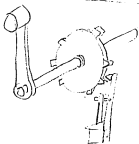
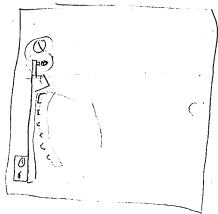
40.



$$\begin{array}{r} 2 \\ 3\frac{1}{2} \\ 3\frac{1}{2} \\ 3\frac{1}{2} \\ 4 \\ 5\frac{1}{2} \\ 5\frac{1}{2} \\ 5\frac{1}{2} \\ 5\frac{1}{2} \\ 4 \\ 2\frac{3}{4} \\ 2\frac{3}{4} \\ 2\frac{3}{4} \end{array}$$

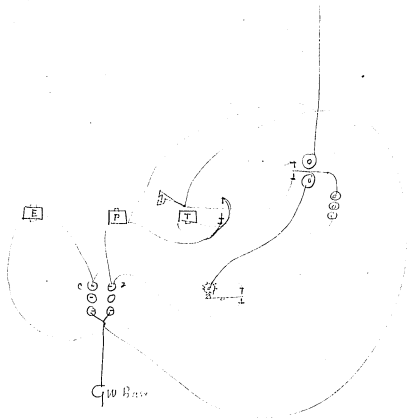
$$\begin{array}{r} 17 \\ 13 \\ 2 \\ 11\frac{3}{4} \end{array}$$



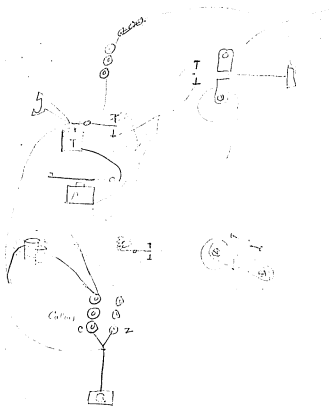


67-2

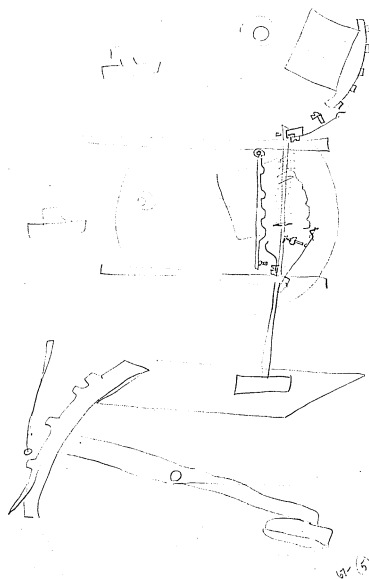




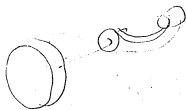
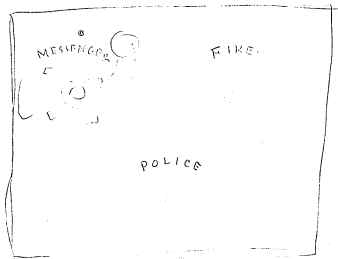
67-2

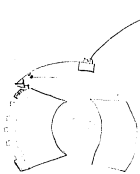


67/14

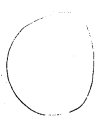
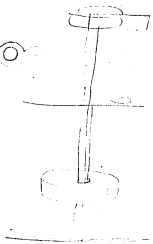
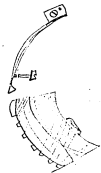


U-39





*Asbestos Plate*



$$\begin{array}{r}
 19) 10000(528) \\
 \underline{95} \\
 50 \\
 \underline{38} \\
 128 \\
 \underline{114} \\
 6
 \end{array}$$

$$\begin{array}{r}
 62 - 17. \quad 213 \frac{1}{3} \\
 15 \\
 13 \quad 106
 \end{array}$$

10

12<sup>2</sup>

25

128

52

8

9800

68-101

410.

$$\begin{array}{r} 770 \\ - 32 \\ \hline 738 \\ - 58 \\ \hline 680 \\ \phantom{0} 5 \end{array}$$

360.

$$\begin{array}{r} 710 \ 300 \\ \phantom{00} 303 \\ \phantom{000} 275 \\ \hline \phantom{0000} 173 \end{array}$$

$$\begin{array}{r} 421 \\ - 58 \\ \hline 363 \end{array}$$

$$\begin{array}{r} 363 \\ - 88 \\ \hline 275 \end{array}$$

$$\begin{array}{r} 305 \\ - 132 \\ \hline 173 \end{array}$$



(6) - 89

1 1  
1 3

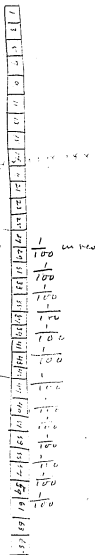
35.  
3.  
1.  
13.

1 ohms. 3 degrees increm-  
 1 " 6 "  
 9  
 13  
 16  
 19  
 22  
 25  
 28  
 31  
 34  
 37  
 40

1 .13

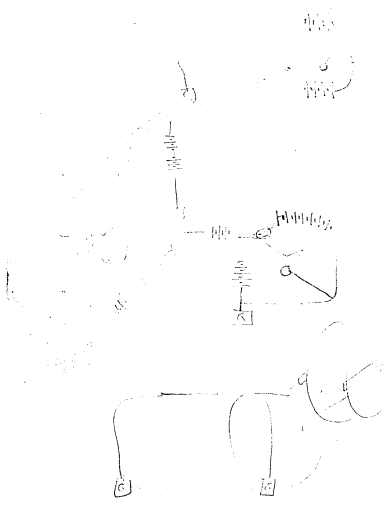
$\frac{13}{104}$

$\frac{1}{2}$



18



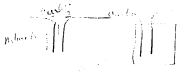
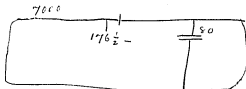


Handwritten symbol or signature, possibly a stylized 'H' or 'th'.

Handwritten text: 100 00 68 (4)



111  
50  
58 20



270

Protonic balance

H<sub>2</sub>O, combined with  
 1 atom of Oxygen Peroxide,  
 N<sub>2</sub>O<sub>5</sub> to form  
 Nitric Acids  
 at an under acid  
 poly Nitric acid

peroxide form



$$11 \rightarrow 545 \cdot (49)$$

$$\begin{array}{r} 44 \\ \hline 105 \\ 99 \\ \hline 6 \end{array}$$

$$19 \cdot \frac{21}{11} = \frac{21}{21} = 1$$

$$\begin{array}{r} 44 \\ 30 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 545 \\ 240 \\ \hline 305 \end{array}$$

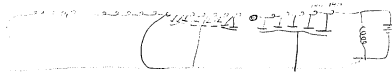
$$11 \rightarrow 545 \cdot (60)$$

$$\begin{array}{r} 32 \frac{2}{3} \\ 9 \\ \hline 288 \\ 16 \\ \hline 304 \end{array}$$

$$\begin{array}{r} 9 \\ 60 \\ \hline 69 \end{array}$$

$$\begin{array}{r} 545 \\ 304 \\ \hline 241 \end{array}$$

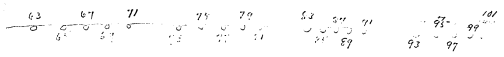
$$\begin{array}{r} 66 \\ 304 \\ \hline 362 \end{array}$$



140  
90

2000  
82  
6000  
1000  
7000

13



6-2

17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72

184.

1444

722

$11\frac{1}{2}$

$26\frac{1}{2}$

126

2 1150

$\frac{1150}{2}$   
 $\frac{2300}{2}$   
 $\frac{2650}{2}$   
 $\frac{320}{2}$

2 | 2650.

1325

$2\frac{1}{3}$

2000





$$\begin{array}{r} \overline{) 4000} \\ 571 \overline{) 3} \end{array}$$

3097

$$\begin{array}{r} 9 \overline{) 5000} \quad (5335 \\ \underline{45} \phantom{00} \\ 50 \\ \underline{45} \phantom{0} \\ 50 \\ \underline{45} \phantom{0} \\ 50 \\ \underline{45} \phantom{0} \\ 50 \end{array}$$

$$\begin{array}{r} 11 \overline{) 6000} \quad (545 \\ \underline{54} \phantom{00} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \end{array}$$

$$\begin{array}{r} 9 \overline{) 6000} \quad (666 \\ \underline{54} \phantom{00} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \end{array}$$

$$\begin{array}{r} 11 \overline{) 5000} \quad (454 \\ \underline{44} \phantom{00} \\ 60 \\ \underline{54} \phantom{0} \\ 60 \\ \underline{44} \phantom{0} \\ 60 \end{array}$$

$$\begin{array}{r} 7 \overline{) 7000} \quad (1000 \\ \underline{14} \phantom{00} \\ 140 \\ \underline{14} \phantom{0} \\ 140 \\ \underline{14} \phantom{0} \\ 140 \\ \underline{14} \phantom{0} \\ 140 \end{array}$$

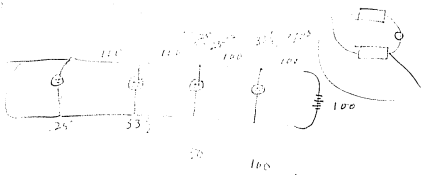
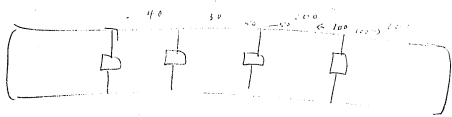
$$\begin{array}{r} 13 \overline{) 4000} \quad (307 \\ \underline{39} \phantom{00} \\ 100 \\ \underline{91} \phantom{0} \\ 90 \end{array}$$

$$\begin{array}{r} 13 \overline{) 4000} \quad (307 \\ \underline{39} \phantom{00} \\ 100 \\ \underline{91} \phantom{0} \\ 90 \end{array}$$

$$\begin{array}{r} 13 \overline{) 7000} \quad (538 \\ \underline{65} \phantom{00} \\ 50 \\ \underline{39} \phantom{0} \\ 110 \\ \underline{104} \phantom{0} \\ 60 \end{array}$$







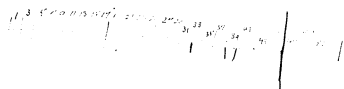
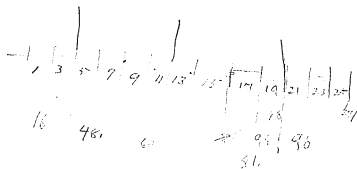
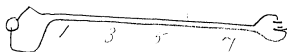
10	26	31	35	39	43	47	51	55	59	63	67	71	75	79	83	87	91	95	99
7	3	5	7	9	11	13	15	17	19										

$\frac{17}{13}$   
 $\frac{11}{9} \frac{1}{2}$   
 $\frac{9}{5} \frac{3}{10}$   
 $\frac{5}{3} \frac{1}{2}$   
 $\frac{3}{1} \frac{1}{4}$   
 $\frac{1}{4}$   
 $\frac{1}{10}$   
 $\frac{6}{10}, 4, 1$   
 17

$2 \frac{19}{4} \rightarrow 17$   
 $3 \frac{1}{2} \quad 13 \frac{3}{4} \frac{1}{2}$   
 $\frac{1}{4} \quad 15 \quad 11 \frac{1}{2}$   
 $3 \frac{3}{4} \quad 13 \quad 9 \frac{3}{4}$   
 $70 \cdot 30 \quad 5 \frac{1}{2} \quad 11 \quad 5 \frac{1}{2}$   
 $5 \frac{1}{2} \quad 9 \quad 80 \quad 49 \quad 3 \frac{1}{2}$

$\frac{5}{4} \quad 7 \quad 1 \frac{3}{4}$   
 $4 \quad 5 \quad 1$   
 $2 \frac{3}{4} \quad 3 \quad 2 \frac{1}{2}$   
 $\frac{9}{6} \quad 1 \quad \frac{1}{10}$   
 $50 \quad 30 \quad 10$   
 $110 \cdot 3 \frac{1}{2}$   
 $13 \frac{1}{4}$

$50 \quad 60 \quad 4 \frac{1}{2}$   
 $\frac{6}{3} \frac{1}{10}$



129

60. 529

364  $\frac{1}{2}$

264  $\frac{1}{2}$

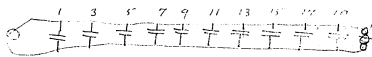
36



3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 7

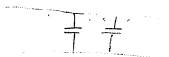
94  
150  
478  
12  
900  
170  
110  
100  
100  
350  
75

350  
412  
37

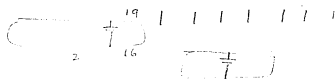


20 40 100 9 450  
51  
49 18.20

837  
418 1/2



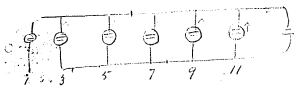
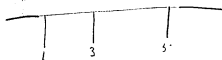
|||||



|||||

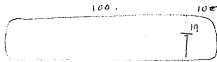
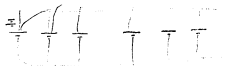






19

36.

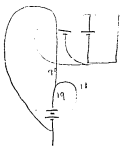


) 173

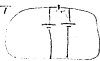
$$\begin{array}{r} 150 \\ 11 \\ \hline 150 \\ 150 \\ \hline 1650 \end{array}$$

$$\begin{array}{r} 173 \\ 11 \\ \hline 173 \\ 173 \\ \hline 1905 \end{array}$$

3.

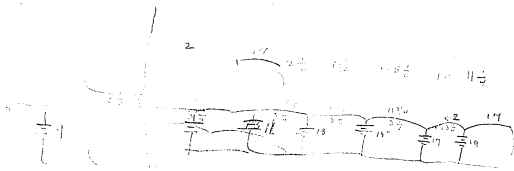


$$\begin{array}{r} 121 \\ 11 \\ \hline 121 \\ 121 \\ \hline 1331 \end{array}$$



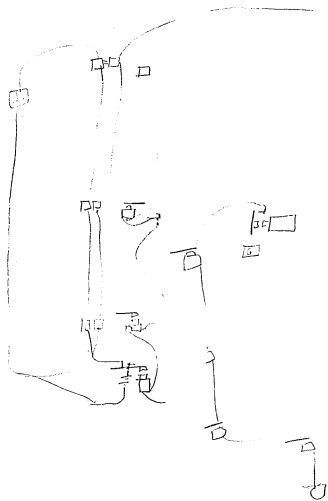
11) 1900 (121)

$$\begin{array}{r} 1900 \\ 11 \\ \hline 1900 \\ 110 \\ \hline 1900 \end{array}$$

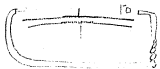


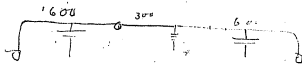
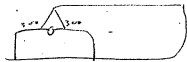
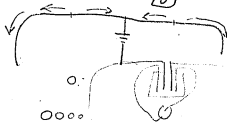
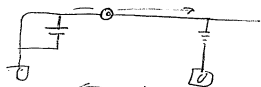
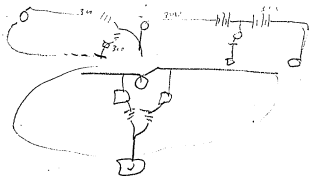
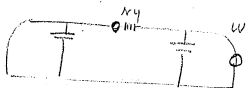
$\frac{2.5}{1.5}$   
 $\frac{1.5}{1.5}$   
 $\frac{1.5}{1.5}$   
 $\frac{1.5}{1.5}$

11



⑤ ±







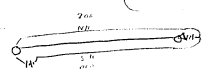
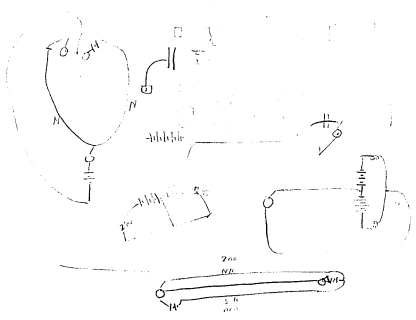
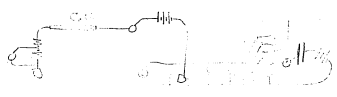
147 2'

147  
42  
55

30 wires on 716. 12.

700  
147  
8  
1176

32  
42  
55

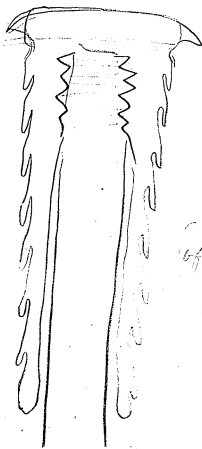






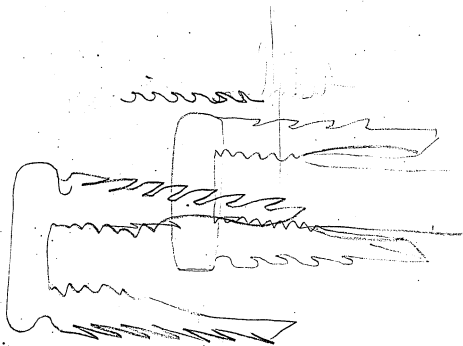
4

Insulator

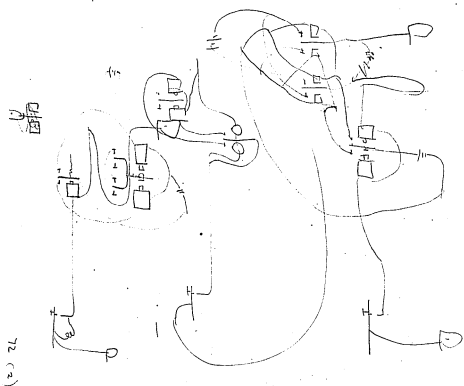


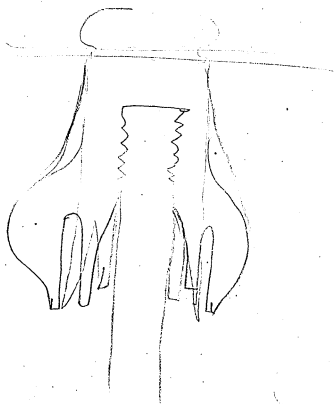
not turned  
of wood

71. (2)



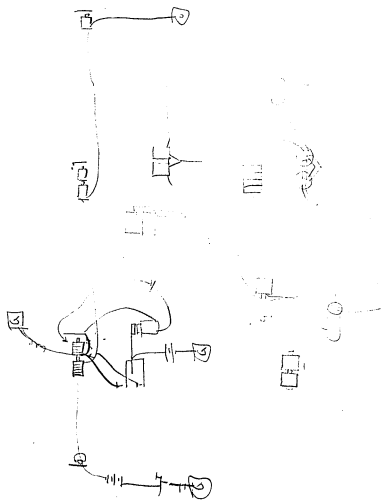
72 (1)



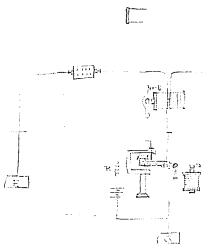




72/4

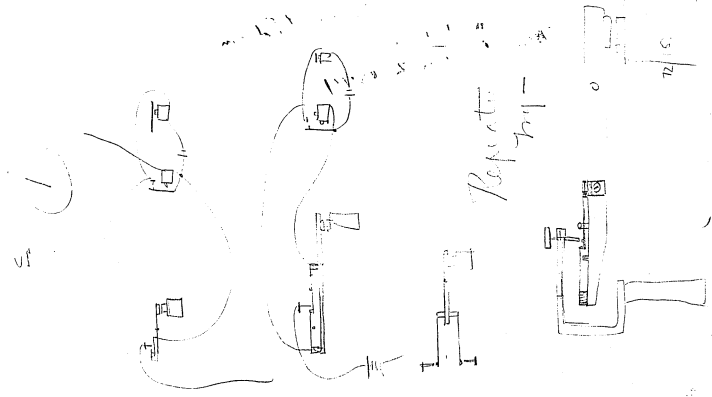


2 / 1 / 3



(R)

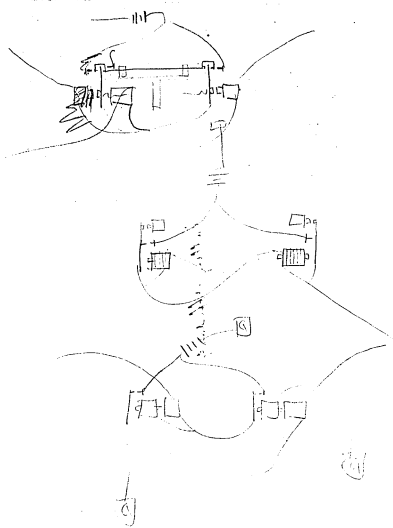
60



Repeater

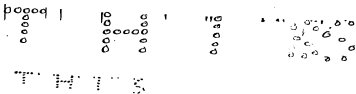
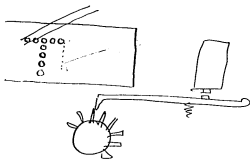
12/5

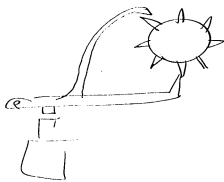
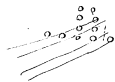




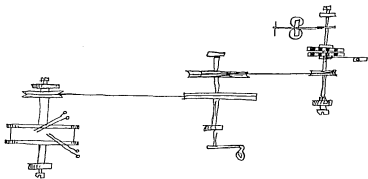
73/11

132

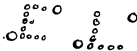
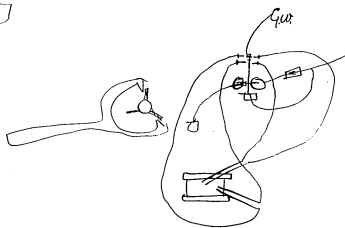
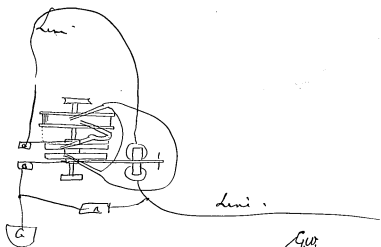


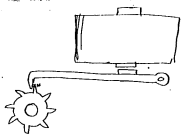


73 (9)



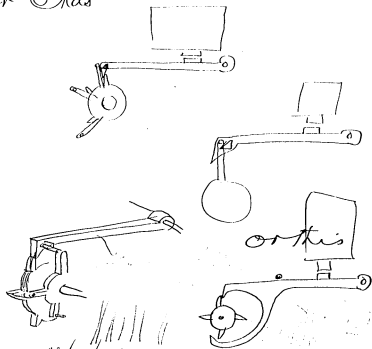
1/26

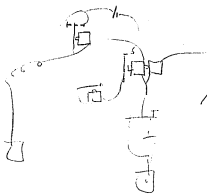




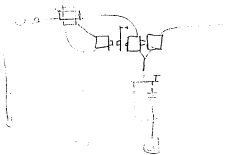
E-1719

Let it drop by gravity if it will do  
it quick enough if not  
make a double wheel that will  
Automatically replace the  
Lever Thus



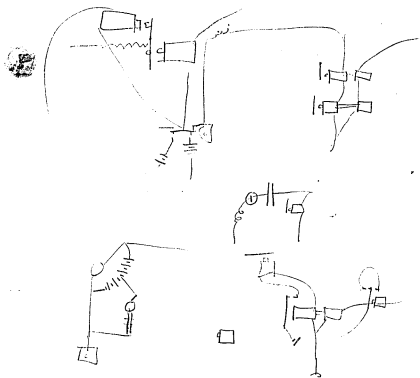


101



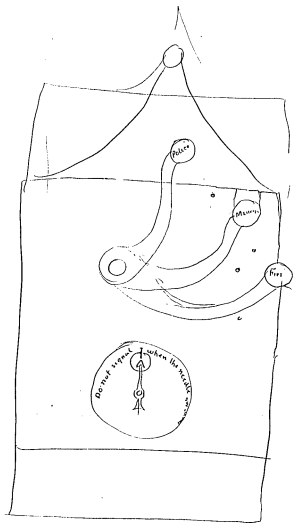
102

74 2



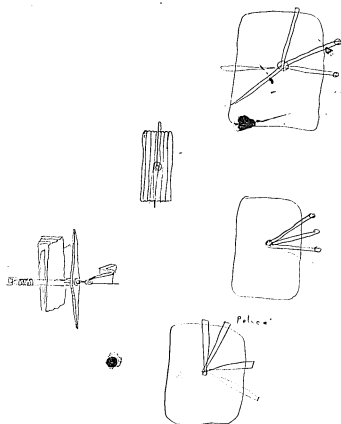


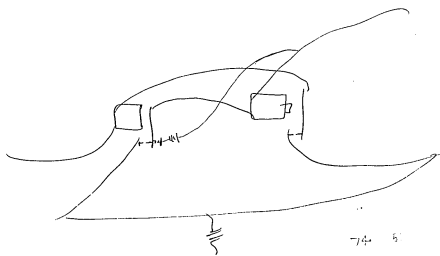
43 47



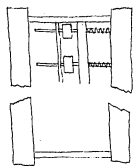
74

111

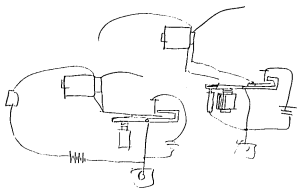
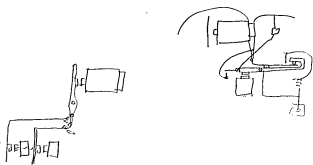




-74- 5

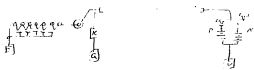
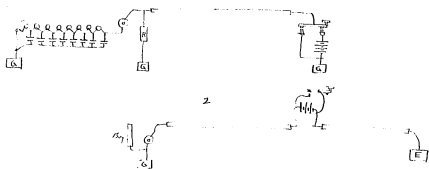


1001

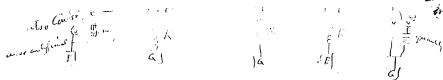


61 52

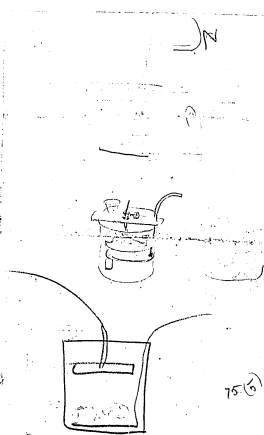




Either possibility



75 H



Telegraphs—No. 295.  
Service Message Form.

POST OFFICE TELEGRAPHS.

Free Message on Official Business.

Prefix \_\_\_\_\_ Code Time \_\_\_\_\_ No. of Words \_\_\_\_\_

OFFICE. 187 .

Office Time Free [paid.]	CLERK	Office Time sent	CLERK

From { *Get on Morgans St* } To { *Station* }

*Ealing<sup>DQ</sup> Station*

*Great Western*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

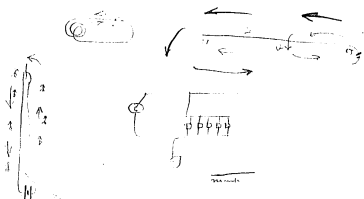
\_\_\_\_\_

Signature of Sender \_\_\_\_\_

G (611) 1/20,000 2/75



U 792

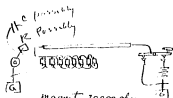


Page 2

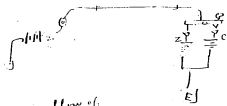
Greenwich



Three same lenses use  
 lens light diffuser in parallel  
 which don't ground static.



Magnet 20000 ohm  
 Multiply 1000  
 since 1000 is per  
 form induction current  
 full read current

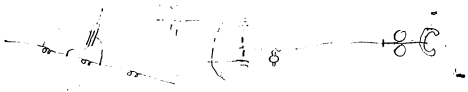
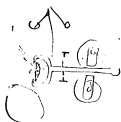


intercept overflow of  
 static at read in  
 end by way in parallel  
 may be useful

possibly the stand

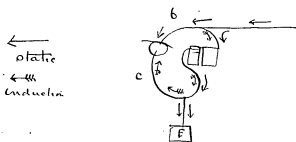
Two pens  
 adjusted diff  
 result to







Charged, now when the battery is disconnected, there is instantly a very slight weakening of the current. This weakening generates an inductive discharge in the electro magnet in the opposite direction. This circulating within the local circuit puts the instrument on a point of no potential i.e. a neutral point. The direction of the two currents will be shown by this diagram



You will see by the direction of the arrows as the static charge gradually falls, that the ~~balance~~ <sup>current</sup> balance each other in the branch b.c. whilst the static has free route to the ground through a.d.

The 14.

Telegraphy there was a harder problem to solve a dash was received thus: from Washn

150 wds  
pr min }  
Sent  
—

Reed  
—  
Req: static

300 wds  
pr min }  
Sent  
—

Reed  
—  
Req: static

Word This }  
300 wds  
pr min

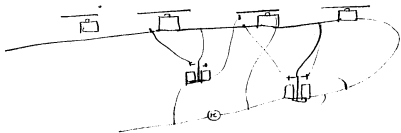
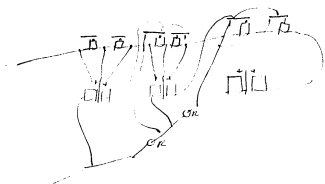
-----

at 1500 words per minute nothing <sup>could be rec'd</sup> but a <sup>but a</sup> straight marks were received, with <sup>but</sup> you have no double coil and balancing <sup>to apply a remedy at its fountain head</sup> circuit but must take what comes, and <sup>through my trials</sup> apply some device to separate the signals from the static charge, in the case of Duplex the signals are so slow that the wire discharges itself completely between <sup>77-V</sup> each dot. but in 'Auto' the spaces between

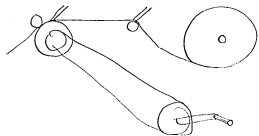
12 14

20

Double measurements







Chemical Telghs

Shunted Recg instrument, No 1225-1854  
Lines 24 to 27. p. 2.

Derivation Leaks along Line. etc No 1225-1854  
p 2 Line. 29. to 40.

Shunts. Leaks No 1225-1854. p 12 line 34 to  
40.

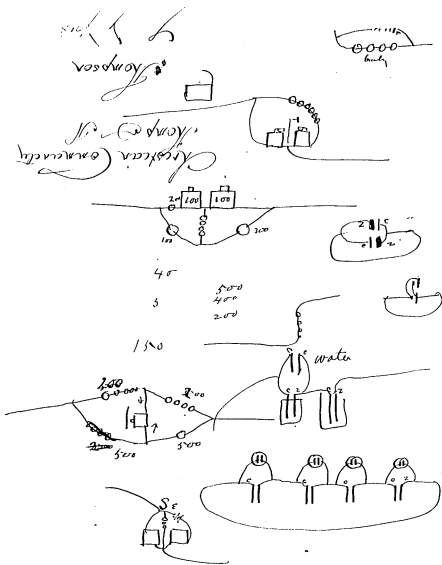
Shunted Receiving instrument page 13. line  
6 to 9. Same patent

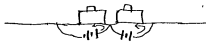
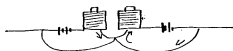
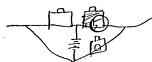
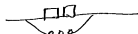
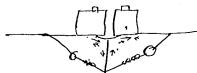
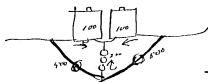
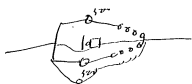
Roller. p. No 2860. p 5- line 15-  
" " Allen 2204 drawing

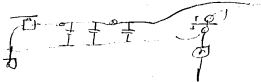
Leaks - abridgment p. 419

Leak Abdgmt p 201

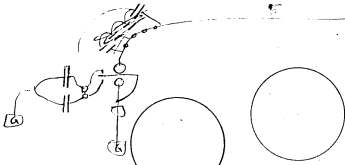
(2.11)







E-1714  
(273)

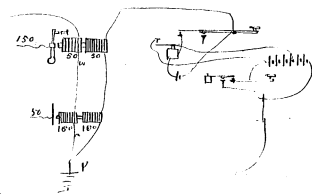
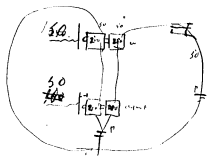
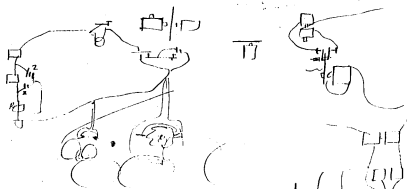


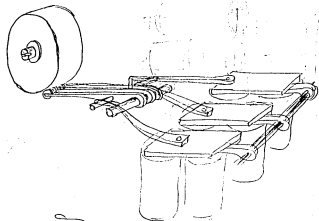
Stonington  
Steamship  
Company  
Cunard Royal Mail  
etc

Java  
Cunard Royal Mail Steamship

78(3)



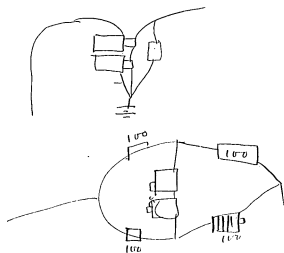




Roman letter perforations

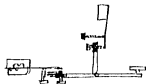
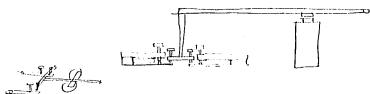
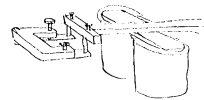
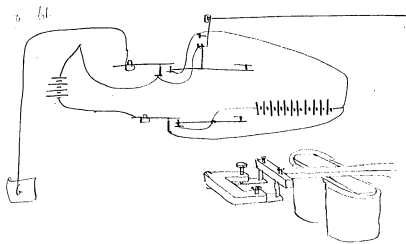
✓ Morse telegraphing

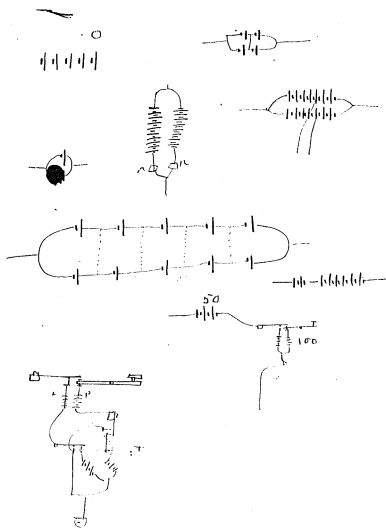
This is a specimen of  
telegraphing in Roman



100 5V 50 50









Telegraphic instruments may be divided into two classes first those which receive and transmit signals represented by conventional alphabets of conventional characters.

Second

### Telegraph Instrumentation

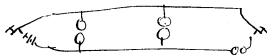
- 1 Visual with conventional <sup>Electrical</sup> Movements
  - 2 " " Roman Letters
  - 3 Baudot's Conventional
  - 4 Baudot's Conventional
  - 5 " " " " Roman Letters
- M.P.P.

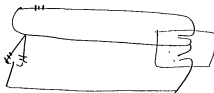
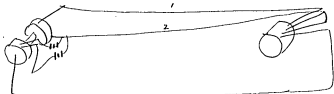
Telegraphic instruments may be divided into three classes. First the Visual Second The Sound. Third Recording.

The Visual except upon Submarine Cables is fast falling into disuse. The Sound is used only in America and the Recording generally throughout the world.

Telegraph Circuits may be divided into 4 kinds. 1st Local Circuits. Ordinary Line Circuits 2nd Compound Circuits with Repeaters or Translators and Submarine Circuits.

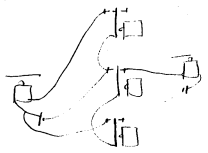
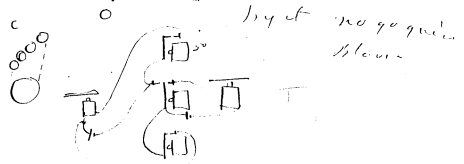
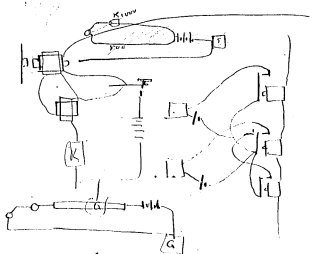
The Morse system instruments are worked by three different systems of currents (79)



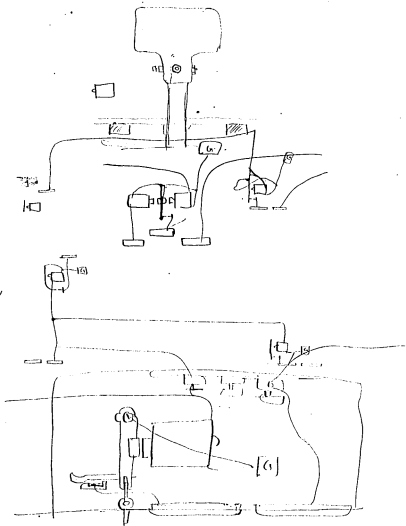


Have paper under a  
 Microscope & ~~write~~ use  
 a very fine print  
 see how delicate a  
 current will mark  
 also use this Micro  
 to investigate current  
 passing over dirt on  
 glass jump apart  
 from 100 cups  
 Battery action take  
 place in decomposition  
 - wet surface &  
 Other phenomena

Attend to Piano  
 project

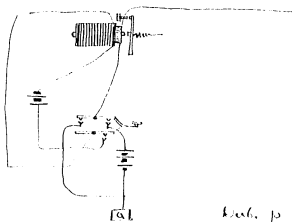


80 11



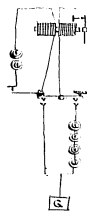
70 2

Int'l. Duplex.



Int'l. p. 29.

or plainly



LINE

20. 2



1834 1110. John Henry Jel

Two Clockworks printing & type  
wheel - Relay. Magnets in  
Local clock = Synchronism -

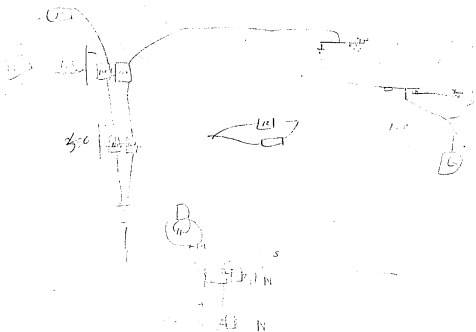
1864. P. 20. R A Brooman

Two Clockworks, two maps are  
partly all type co. type wheel  
Both maps numbered by means  
of discussion on the right of  
Comment

1856. 1050. Petit de la Comte de F Moreau  
Compte de J. A. Dumoulin

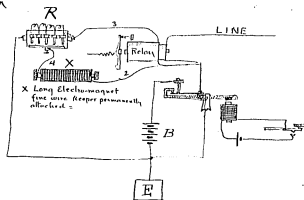
Clockwork. Electro magnet & signal  
ply Local

1856. 2345 - H mapple & M mapple  
Nothing definite

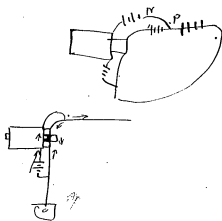
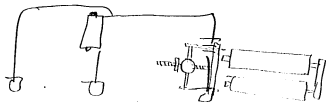
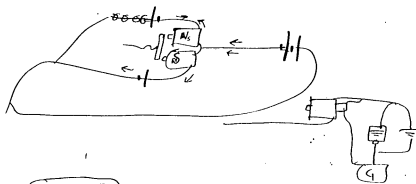


C. L. Gouraud.

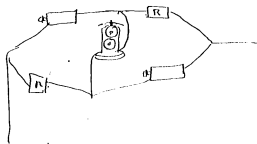
Here is a Duplex, which dispenses with Stearns improvement. (The addition of the Condenser,) and replaces it with a more powerful instrument to neutralize the static charge on the receiving instrument at the transmitting station. I have sold it to the Western Union and if you and Mr. Luther Clarke can do anything with it you can have it remembering my "dower"  $\frac{1}{3}$  - I will show it as applied to the Amn System



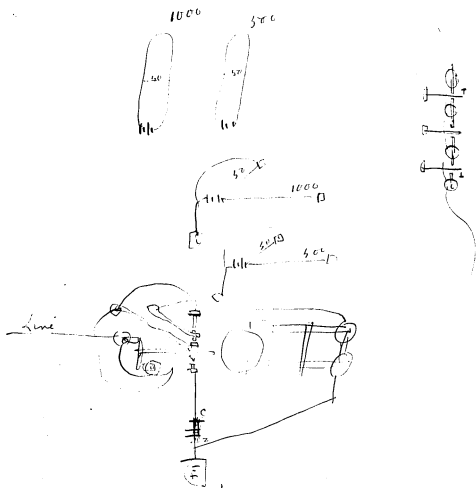
R is a rheostat. X • a Long magnet wound

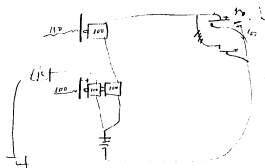
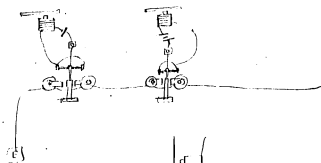


for working French Cable without Varley  
Condensers.

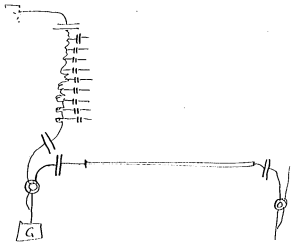


Eight



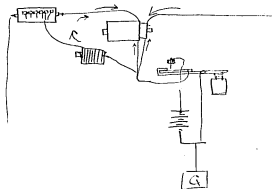


Y 14





a Duplex telegraph. I apply a Common electro magnet in a way he dont. and obtain a more powerful device for balancing the Closing and opening static Charge. which will cope with those underground wires better than the Condenser, You and him can have it giving me  $\frac{1}{3}$  if you realise,



The device which he calls his for putting on & off the main battery without effecting the continuity of the circuit was invented by Moses L. Farmer in 1858. and by an Englishman 1862. See English patent No ———

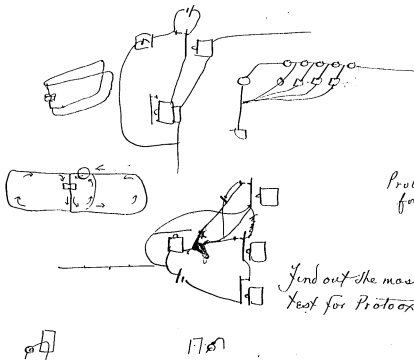
Brett in his Printer used the hand trans-  
mitter. Sheffner p 282

Brett in his Printer used a type wheel  
containing figures, letters spaces &  
other signs. Sheffner p 282

Brett used positive and negative currents  
for working a release escapement; for  
rotating a type wheel. Sheffner p 283

Zanni, 1868, English Pat.  
No clockwork—

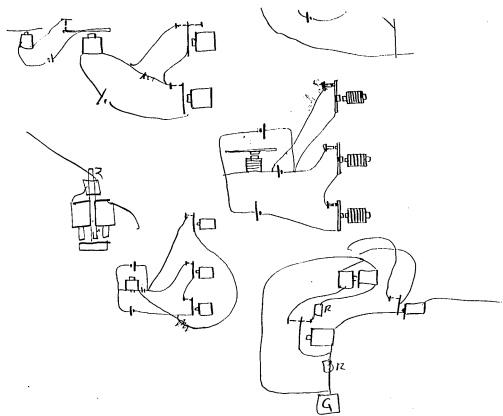
you were fourth thousand  
fourth Ward Politician Norman C Miller



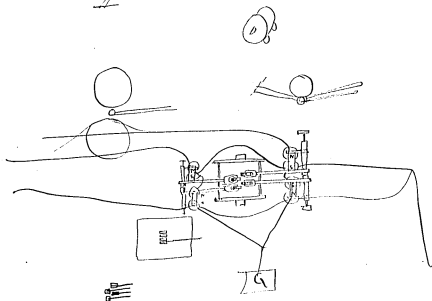
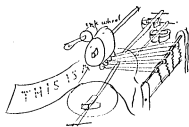
Protoxide of iron  
formed under pen

Find out the most delicate  
Test for Protoxide of iron

82 i



73



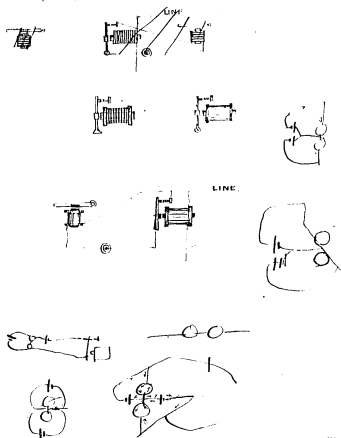
as will be if he was afraid  
 the of allowing so much that is  
 electrical ~~idea~~ ~~pass~~ ~~to~~ ~~gas~~  
 } brought his brain.  
 } They may be slowly  
 decomposed into



I expect Wilbur's brains are being slowly  
 decomposed ~~the~~ by excessive dabbling into  
 the electrical ~~the~~ product will probably  
 be the phos<sup>phate</sup> ~~of~~ "Refer to English  
 Patent No. 150,500 & the Hydrate of.  
 "Your 108th claim is disallowed =

If he will test the <sup>phosphate</sup> Hydrate of old  
 Eng<sup>lish</sup> patent & the Hydrate of  
 Eng<sup>lish</sup> ~~is~~ disallowed with a Copy <sup>iron</sup>  
 with a few pounds of ~~loose~~ ~~of~~ ~~of~~ ~~from~~ ~~iron~~  
~~of~~ ~~several~~ ~~of~~ ~~the~~ ~~faculties~~ ~~of~~ ~~the~~  
~~psychic~~ ~~faculties~~ ~~of~~ ~~the~~ ~~human~~ ~~mind~~ ~~the~~ ~~product~~ ~~will~~  
 be ~~the~~ little patent, a very old  
 but lately regenerated compound

Local circuit movements Figure 1 gives the ordinary method of arranging the local circuit.



82 (3)

We have a <sup>two</sup> semicircle in water. pipe if  
with a <sup>equivalent</sup> ~~certain~~ force ~~so much water~~ ~~can be~~  
~~to pass through a given pipe~~ will pass  
100 gallons of water through 100 feet of  
pipe 1 inch in diameter in 1 minute  
Then that same force will pass only 50  
gallon of water through 200 feet of pipe  
of the same dimensions, ~~the more~~ <sup>the more</sup> if the  
diameter of the pipe be reduced still  
less water will be forced through.  
The addition of more pipe or the ~~reduced~~  
of the size adds resistance to the  
passage of the water

with the battery it is the same for  
with <sup>100</sup> feet of ~~iron~~ wire, and of  
a certain size, 100 units of electricity  
will pass in 1 minute if now the wire  
be made 200 feet long but 50 units of  
Electricity will pass in that time ~~the~~  
if the <sup>quantity</sup> ~~diameter~~ of the wire of the same  
as with the <sup>pipe</sup> adds resistance to  
the passage of the Electricity.

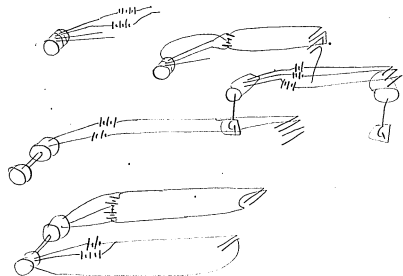
~~The wire may be so lengthened~~  
In the Voltaic <sup>matrix</sup> circuit the battery  
itself forms an <sup>or passage</sup> obstacle to the  
Conduction of its own current; the leg  
between the Copper and the Zinc  
offers <sup>as much</sup> resistance to the passage  
of the current as many feet of  
wire. If the <sup>path</sup> from the zinc to 1



Three  
Copper had no resistance, there would still  
be the resistance of the battery in the  
circuit, <sup>obstacle or</sup>

To reach the point (When the resistance  
of the Conductor of the Current <sup>is that of the case</sup> ~~is~~ <sup>is</sup> equal to  
the Zinc & the Copper is equal to  
the resistance of the fluid within the  
battery position then ~~the~~ all the electricity  
which the battery will generate pass  
within the circuit - by still further  
decreasing the resistance of the outside  
part of the circuit no more electricity  
is generated but the total amount  
which is confined to a smaller area  
is ~~each~~ if the resistance of the  
circuit which is conveying the total  
product of the battery was reduced  
one half each ~~at the same rate~~ <sup>along</sup>  
of the ~~substantially~~ <sup>comparing</sup> circuit would  
there be conveying twice as much  
electricity as in the former case but  
the total amount <sup>will remain</sup> ~~would~~ <sup>be</sup> unchanged

If the ~~plates~~ Zinc & Copper plates are  
placed very near each other the internal  
resistance of the battery is reduced  
is the electricity ~~does not~~ is not  
compelled to pass through such a  
length of liquid which is a bad  
conduction. Consequently the capacity  
of the battery for generating a current  
is increased if how the outside is



8.0

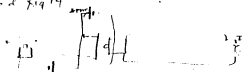
using double helix, etc

Connections for allowing the local magnet inactive when the Relay magnet is active.

first method fig 13

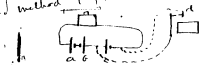


Second Method fig 14



the two balls oppose each other when the relay lever is attracted to the magnet

third method fig 15

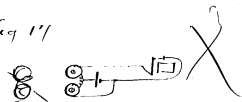


When the relay arm lever is away from the point the balls a & b oppose each

other and the battery c acts to create the local magnet. If the Relay Lever is brought forward to the point d then the battery c is shunted leaving a and b opposed to each other and no current within the circuit.  
fourth method fig 16.



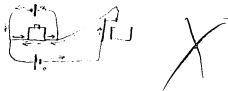
Sixth Method fig 17



When the Relay point connection is broken the current circulates in ~~one~~ ~~direction~~ ~~in~~ one spool. When both circuits are intact. the current <sup>(B. 3)</sup> passes in opposite directions through both spools and balance each other.

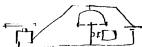
and produces no effect upon the magnet.

Seventh Method fig 18.



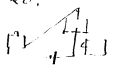
When both circuits are closed no current passes through the magnet as shown by the arrows

To make a local magnet <sup>close</sup> open and ~~close~~ open when the armature bar of the relay is closed. fig 19

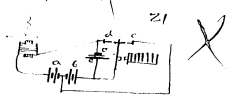


To make a local magnet open and close when the armature bar of the relay is closed.

Figure 20.



To make a local magnet close and open  
 twice by one forward movement of the  
 lever of the Re. Co.



The batteries a and b <sup>each</sup> have double <sup>2</sup> ~~less~~ the  
~~number of~~ cups as the battery c. <sup>or they are</sup>  
<sup>for</sup> connected to oppose each other the  
 battery c, which operates the local magnet  
 when a & b are opposed to each other.  
 is obtained when the ~~an~~ relay lever is  
 in contact with the point d. ~~and~~  
 the ~~an~~ local magnet ~~loop~~ is <sup>unaffected</sup> ~~away~~ from

Fig 7

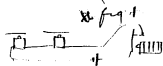
5-



In the figure 6 the local magnet forms a part  
 is placed in the main circuit when  
 the armature of the relay remains  
 unattracted, but is disconnected from it  
 attracted ~~to the main~~ <sup>to the local</sup>  
~~circuit to much prevent the local~~  
~~Co. and the line~~ giving to the size of the  
 wire upon the local magnet it  
 remains unaffected by either the local  
 battery or main battery while  
 in the main line, advantages in  
~~taken of this arrangement in the~~  
~~author's~~ Dutton repeater

To make one Relay operate two local  
 magnets,

First, and ordinary method.

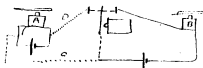


8-1

neutralized by that of the other, and a quick action of both magnets is obtained if the two shunt ~~are~~ are ~~are~~ are nearly balanced.

Fifth Method

Fig 11



The magnet A is operated by the shunt <sup>10</sup> and the magnet B in the ordinary way manner.

Sixth Method

Fig 12



In this arrangement <sup>or</sup> both magnets are operated by the shunt C D & the other by the shunt E F  
~~A large number of~~ ~~a great many~~  
~~a number of all arcs. It is obvious~~  
 Other changes can be made by dividing the coils of the Electro magnets. <sup>Fig 2</sup>

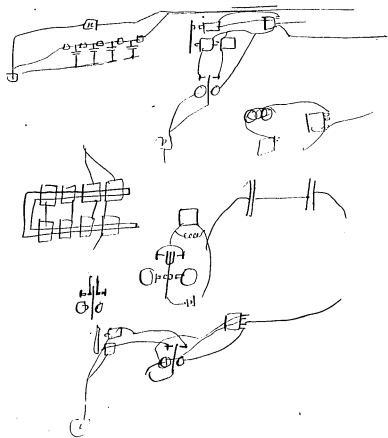


1838, No 1234. Charles Wheatstone. Clockwork only no  
Electrical Movements.

1845. No 12, 136. W<sup>m</sup> Henry Barlow & Jos Foster.  
Double Clockwork movement, advance & retrograde  
movement, One current advances the other retrogrades  
and ~~the~~ both together perform some other function  
probably printing the patent describes no magnets  
or wires and the drawings show none very obscure

1855. No 18. George Edward Doring. Printing telegraph.  
Involves one printer on simple wave principle like  
Hughes. Another this - Type wheel rotated by  
Clockwork regulated by escapement and electro  
magnets in local circuit operated by relays  
which work by reversals in the main circuit  
the relay responding to a P Current -  
to one to a N Current. There are five Escapement  
wheels One Escapement is worked by an  
Electro Magnet in a Local Circuit

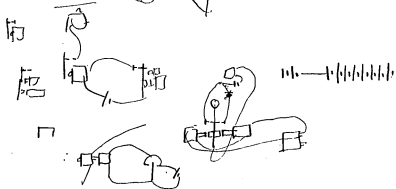
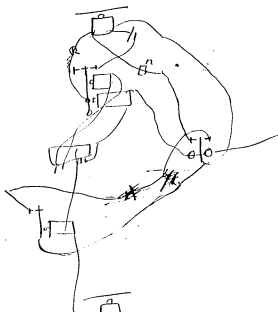
6-43



1546. 11 481. News Poole-

A most ingenious mode of effecting the printing  
The type wheel is rotated by a Clockwork controlled  
by an Electro Magnet. The printing hammer  
constantly comes up & down at regular  
intervals, whether the type is being  
located or not, the time between one beat  
of the ply bar & the next is sufficient to  
make one revolution of the type wheel  
so that if the word letter B is  
to be printed, then the type wheel is  
advanced thru and held till the  
printing hammer is brought up by  
the action of the Clockwork  
etc so there is plenty of time to  
go from any one letter to another  
before the hammer comes up.  
This could be improved & be made  
unhackable.

9511.

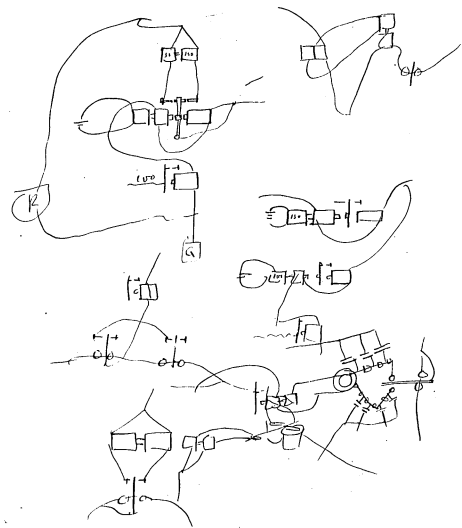


1846 No. 2646. Louis F C Breguet,  
Clockwork type wheel, Escapement lever  
has a vibrating joint which closes a  
local circuit to do plg no drawings

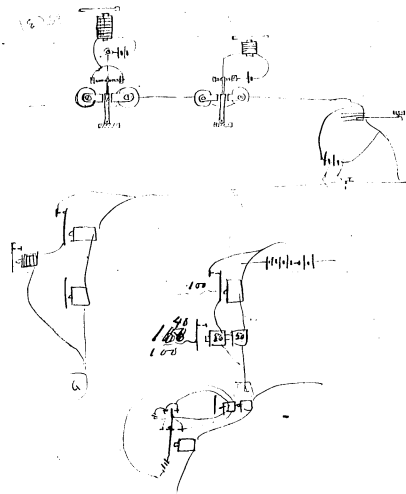
1848. No 12084 Jacob Bull  
Clockwork type wheel, plg by air. Described in  
Whiffen

1857. 1183 Edmund F Barnes.  
Described in Whiffen One magnet working  
Escapement operated by Clockwork.  
The magnets operate in local circuit operat-  
ed closed by relay in line - printing  
Affected same as in old House by the  
Clockwork

1863. 2262 Warren Thompson  
two Clockworks one for plg other for type  
Type W-F controlled by double polarized  
Magnet same as Manchester, Reverse Circuit  
plg done by mechanism actuated by motion  
of type wheel

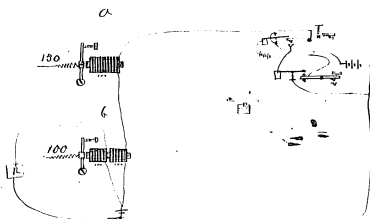


85



85





open b & closed.  
50 H.

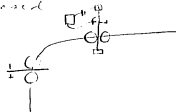
Lead Open. - a & open b closed.

Closed a open b

50 on a closed

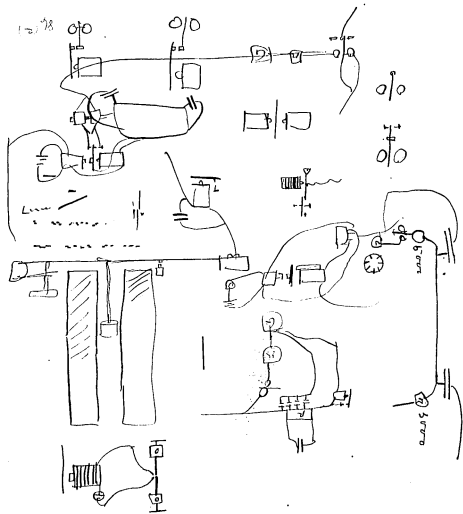
100 on

open

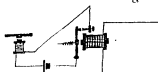


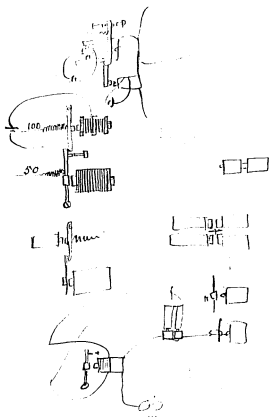
SC: 17



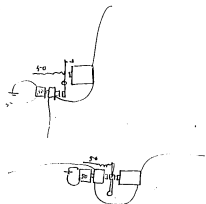


11 May  
18 Enqta





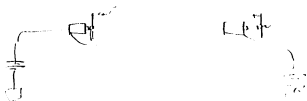
86 2)



86

ii

Telegraphing from one station to another on a closed ckt



By working the armature of the relay back and forth like a Morse Key the Green flashing a message may be sent while the regular current is closed.



86 47



Water Rheostats, sliding, used by Little  
Page. 139, 140 Schellen.

Stylus Box for perforator patented by Little  
page 450. Schellen.

Adjustable, shunt, derivation, or potential  
dam. The fundamental basis of Little's System  
& patented by him See Casselli pantelegraph  
Blavier page 275 also Dub. page 461.

Little's patent for shunt circuiting battery  
Receiving end See Casselli in Blavier  
also Bionelli Typotelegraph ditto Page 303  
also

Leaks for discharging the line the second  
point in his system. English patent 458.  
1862 Lines 20, 21, 22, 23, 24.

Shunt at receiving instrument. English pat no 3095-  
1862, Lines 33 to 37. (Leakage lines 27 to 29, 31, 2)

Leaks No 206. 1860. 36 & 37 lines.

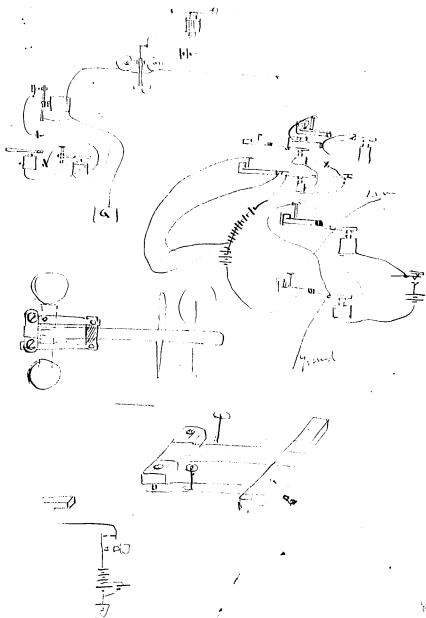
Rec'd instrument in Denver's circuit  
No 3354. 1865. 17 to 24 lines

C/ of Henley: will Koller pass  
+ Whitehouse

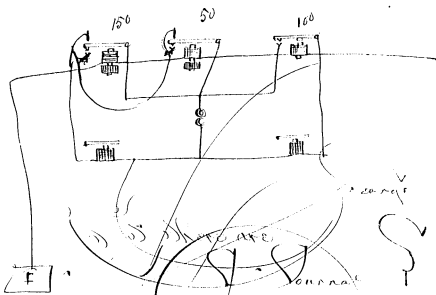
4 all of better patents,  
+ balance down at Shop

87<sup>2</sup>

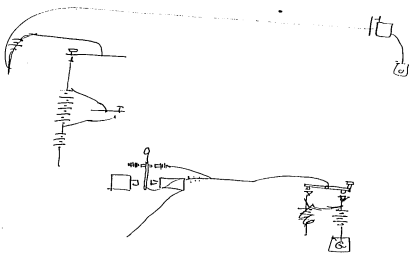
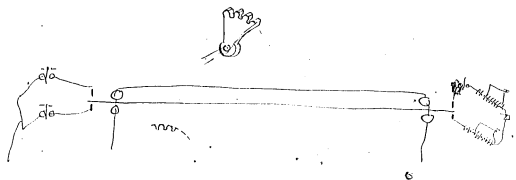




87

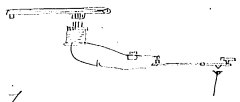


'more things in ~~the~~ <sup>the</sup> ~~Journal~~ <sup>Journal</sup> and ~~the~~ <sup>the</sup> ~~Journal~~ <sup>Journal</sup>  
 'more things than is ~~the~~ <sup>the</sup> ~~Journal~~ <sup>Journal</sup>  
 of in your ~~Journal~~ <sup>Journal</sup>  
 'more things ~~Journal~~ <sup>Journal</sup>  
 'more things ~~Journal~~ <sup>Journal</sup>  
 'more things in heaven ~~Journal~~ <sup>Journal</sup>



Chicago  
Twenty

Mc SK  
T Y  
Mc  
J T T  
T K  
T Mc } Y T



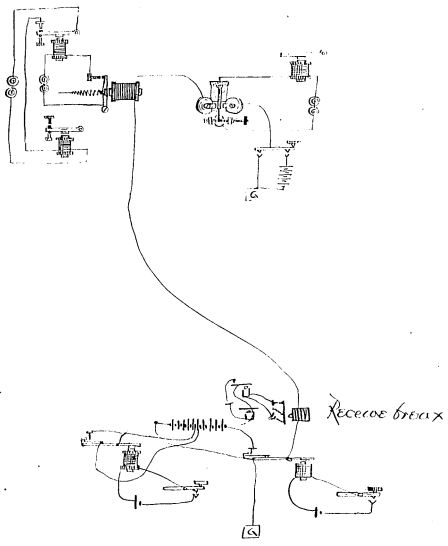
J. H. The boast of heraldy

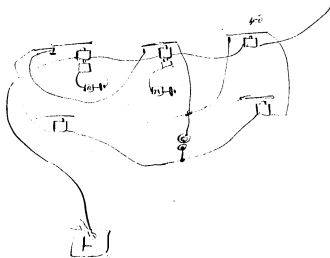
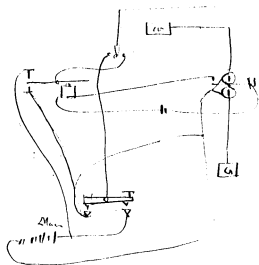
*The boast of heraldy of pomp and power all that*

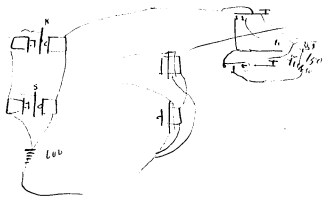
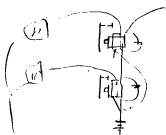
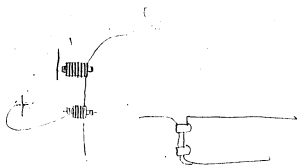
The boast of heraldy of pomp and power  
All that beauty all that wealth ere gave  
Alike await the inevitable hour  
The path of glory leads but to the grave  
The boast of heraldy of pomp and power

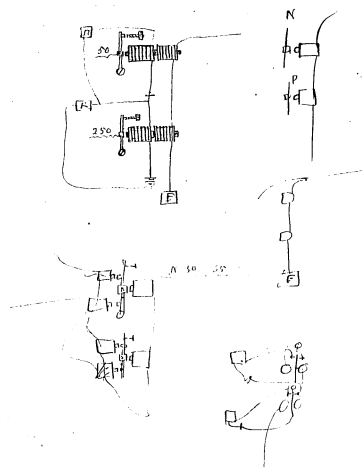
Diffusion  
Diffusion  
The boast of heraldy of pomp and power  
There were three crews sat on  
a tree and they were as black

Keenest  
The boast of heraldy of pomp and power  
The boast of heraldy of pomp and power  
The boast of heraldy of pomp and power











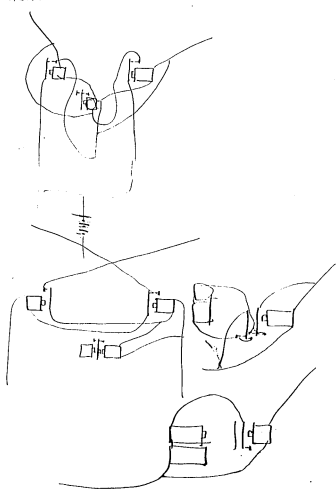
with fine wire with the Keeper permanently attached thus

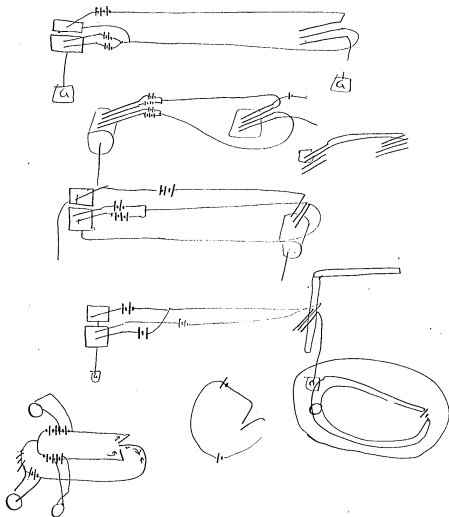


This magnet may be placed anywhere along the rheostat line by the strap on the side of the Rheo to which is connected the wire 4.

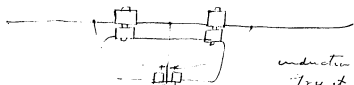
~~At the moment of closing the m pulling on the battery B. the coil inner coil connected to the line receive an impulse~~  
When the battery B is connected, and at rest, the current effect of the current is balanced in the double helix relay. The line is statically charged and the long magnet is also charged if now the battery is disconnected the static charge follows passes through the line coil, and would throw it out of balance were it not that the long magnet X is

REPEATERS





~~Three movements up in one circuit~~ <sup>19</sup>



induction  
try it, outwire

Three movements in one circuit

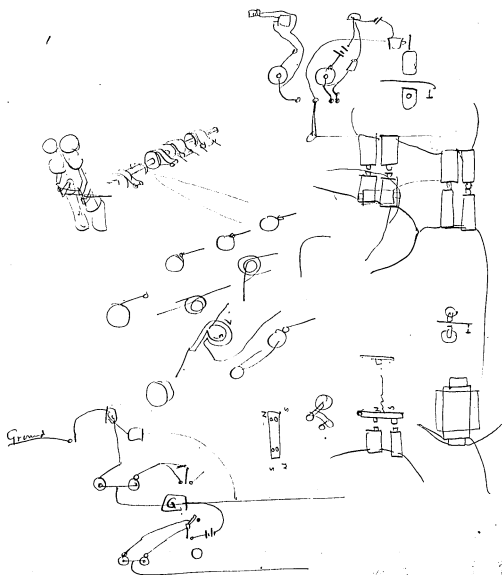


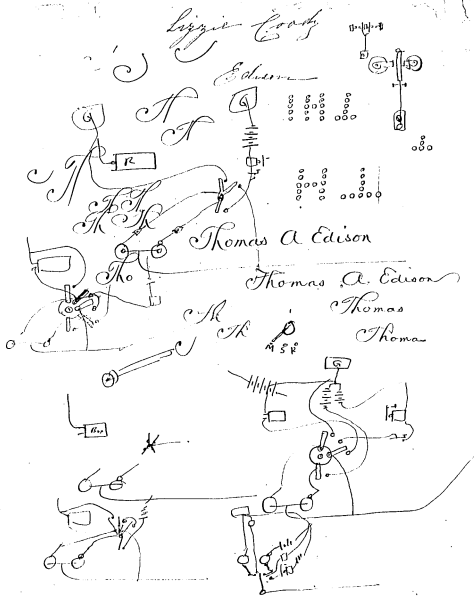
a responds to intermittent P currents  
B to intermittent I N currents & C  
to both or by working with a P  
Current of 1 value & a N of higher value  
both a & b will respond to their  
respective currents but C to the  
Current of highest value Other add  
= Mechanically

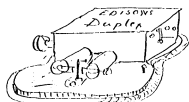


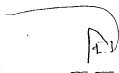
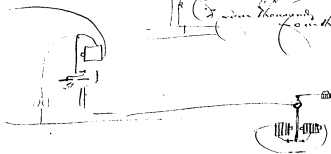
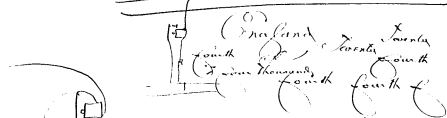
Second



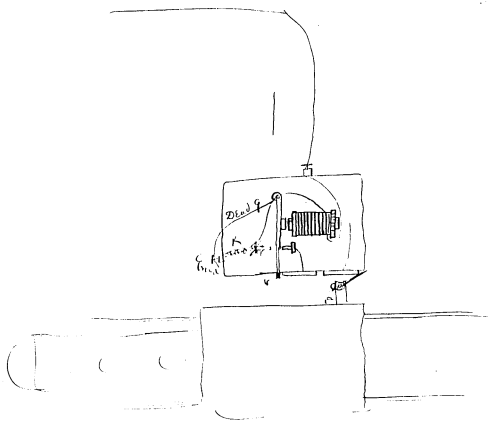








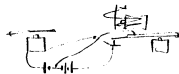




90

of the effects of a total wires hence will  
~~not respond~~ will only respond to the  
 permanent current.

Second. By sending reversals within the  
 local circuit the magnet will not  
 respond to ~~very slow~~ even slow interruptions  
 in the primary circuit

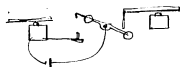


third

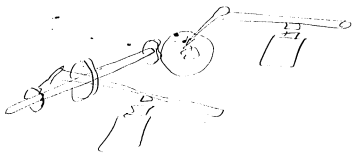
to prevent response

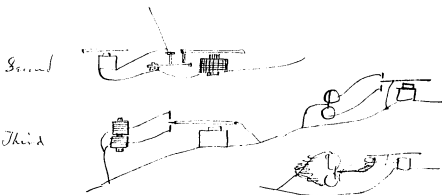


fourth.



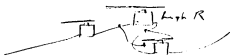
1000 Cyclic Telegrapher  
- 14. - 6



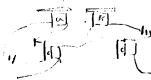


all of the slowing movements as in the vibrating  
with local or secondary CKE

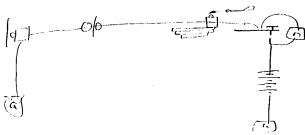
place in other dust  
extending



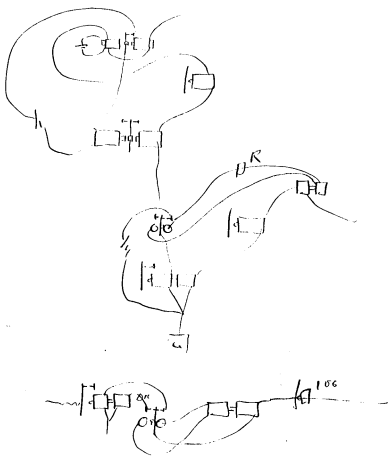
Movements by relay and secondary  
Circuit



$\frac{1}{2}$  current 10<sup>3</sup>  
Some could be low  
work by wire... to  
move B and  
open up of the wire to  
open

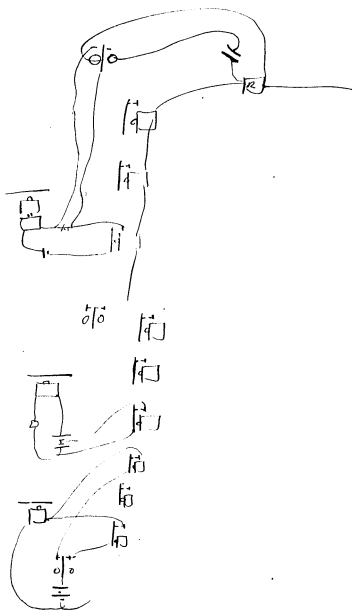


90



90

90

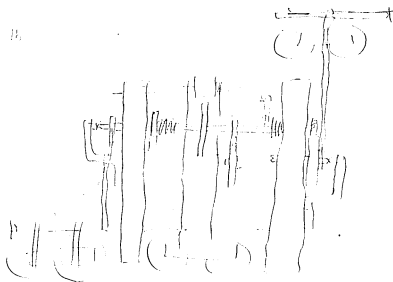


91

91 1



3 B.



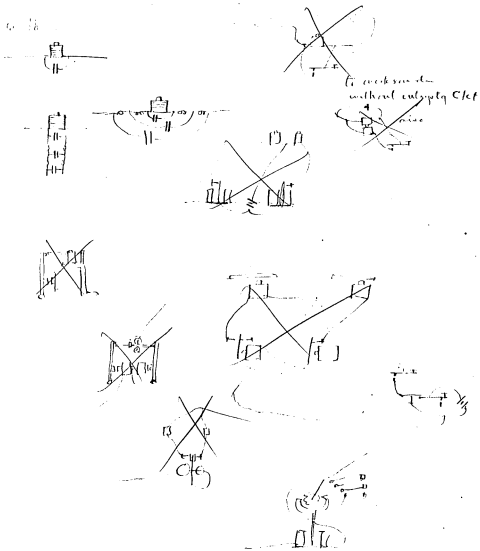
use more op. wind  
number geared slow &  
fixed

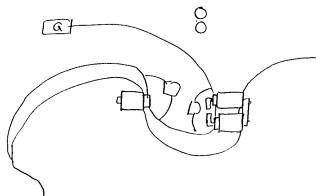
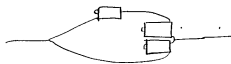
Rec'd from post paper  
through 3000 ohm 30  
caps & fixed relays  
& resist. with 10 caps  
control see speed

○○○ ○

○○○○○  
○○○○○  
○○○○○  
○○

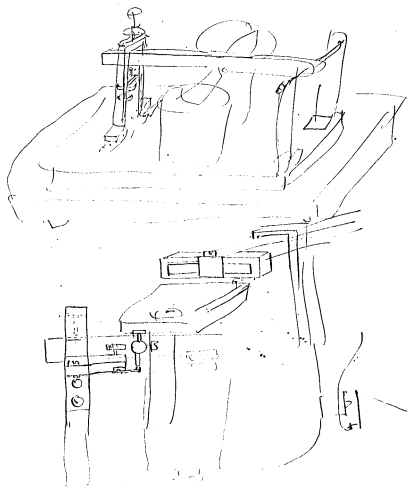
○○○ ○  
○○○ ○





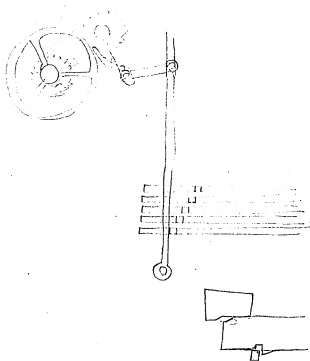
91

92



92 (1)

92



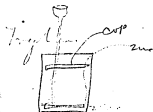
92-2

ZnCl<sub>2</sub>

aluminum chloride  
white solid  
blue  
ZnCl<sub>2</sub>  
in

see if it will react  
diffusion of these liquids

also try also in this  
solution will mixed &  
see if it will expand  
there



powder ZnCl<sub>2</sub>  
sol. 2 is heavier than Sol. 1

many water - <sup>the</sup> mixture  
will not mix. color  
and energy with battery  
see if it will work when  
mix

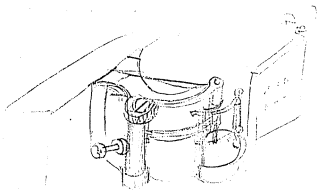
Ozone point discharge  
Electrical machine  
Experiment page  
101. play book  
Science paper

by J. L. Mangan  
platinum pen -  
also with zinc

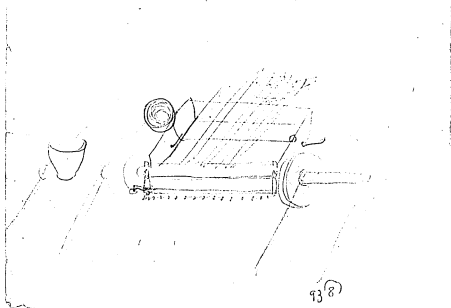
92

Pass spark through  
lamp of blue  
blue V. a ferrous  
Beautifully lighted -  
Play book 239

Palladium pen also a  
palladium reagent.  
Crooke. 289



93





93

Write Maxwell a description  
of electric phenomena of the diffusion  
of liquid

Try the diffusion of different  
substances via two platinum  
electrodes



Molasses  
" Chromic Acid  
" Chromic Yellow  
" Prussian Blue  
" Prussian B + Alcohol + diffuser  
Cotton

Try two different colored  
precipitates

Try evaporating different  
chemicals on clean piece  
heated zinc to show different  
colors for each one or  
on clean polished steel  
or iron or Antimony

New Reagent for Ammonia  
in minute quantities in  
water & in other cases  
Crookes p 29

Magnesium on place zinc  
in battery most powerful

try it

~~try Chlorine Chlorine~~  
~~try Chlorine~~

Wet it + outside of  
battery connect platinum  
wire platinum for all  
pole immerse in Nitric  
A -

~~Frank Crookes 37 p~~

Reagent for Calcium

- Tungstate Soda -  
Crookes 38.

Sulphide Ammon Chloride down  
black persap with Uranium

get Uranium pen -

Crookes 55 it forms Prologide

good

93②

with Wynn pen protox  
- best with Ferro + Ferrid  
when testing with ferric  
~~the~~ sulfate of  
Ammonia will prevent  
red persap —

Try Zinc Export Crowker  
61- ) was got than pure  
Zinc —

Zinc pen - ferric + ferrid  
Ammonia - or Chl. Sulfur  
persap insoluble in Ammonia  
guess to what hence  
use a colored paper

It is quite probable  
that a ferrocyanide  
throws down a persap  
with oxide of zinc Prot<sup>or</sup>  
pen I dont know which  
a zinc pen would be  
found very delicate  
possibly ferrid would throw  
down a persap as under  
the pen like first oxide  
would probably be prot  
should the persap be  
be white the of course  
a colored paper should  
be used some Dye 93  
wood colored is probably

The best ~~Crack~~  
for information refer  
Crack 62

It may be that a  
black peroxide  
might be dissolved in  
some solution which  
would bleach it  
and under the  
action of the current  
the bleaching action  
destroyed platinum  
film

Get Chromium metal  
from Beardslee Co.  
nickel plate

Barium per - forms oxide  
- add the sodium make it  
the Barium add  
but a form peroxide

in regular form  
associate a magnesium per  
so that it will come before  
the iron also after see  
the effect

93④

to make prolate de won  
Crooke 71

Sulphuric acid of iron etc  
something Crook 72

Something page 73  
Crook

Calony page 74  
or page 75  
Caramel.

Manganese Compounds  
& a Conducting salt  
+ Copper etc.

115-Crooke Iron per  
Sulphuric acid - <sup>iron</sup> solution

Prolosalt kept from  
oxidation by placing this  
with pure Camphor in  
clean dry paper  
Crooke 1125

Get some Hydroferrocyanide

Discoy Iron from span  
is a soft iron known  
get some for pens

93 ⑦

Something = alloy of metals  
p 385-

Something do p 391

" " 393

" " 440

" " 422

" " 453

465-

Get some alloy to examine  
470

Nickel prot. prep by  
Ammons

481 - refer to  
Palladium get some

Connect a table  
in Newark up  
all above board  
like Kille's diagram  
+ have CV send you  
with no shunt  
use his Conder  
see what speed  
if not more than  
100 good weight  
JCK to make Parson  
Extent etc see  
to witness

93 ⑥

93

93

get metallic. uranium for a  
pen  
do Osmin

Ruthenium Crooks page 298  
Hypodermic Saltem with  
ammonia gives good permanent  
color in the  $\frac{1}{100000}$  part

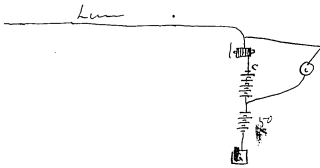
Put some prolo chloride  
~~of potassium~~ Uranium in  
ferrous regular solution  
to prevent protox. going  
to a per the salt  
redox uses go to  
a protox - a

J. C. REEF, Agent

OFFICE  
Kansas Pacific Railway Company,  
No. 80 BROADWAY.

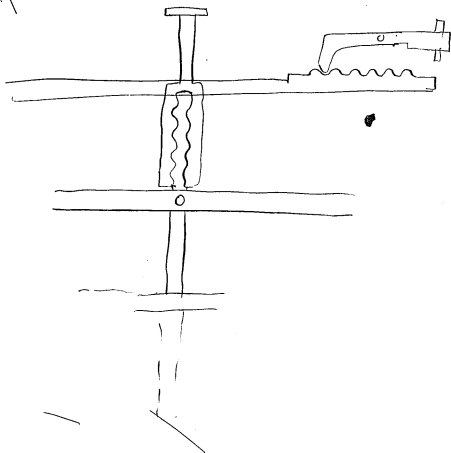
New York.

57



94 (1)





94

36

Fig 3

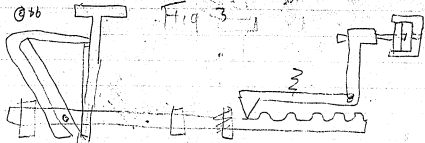


Fig 4

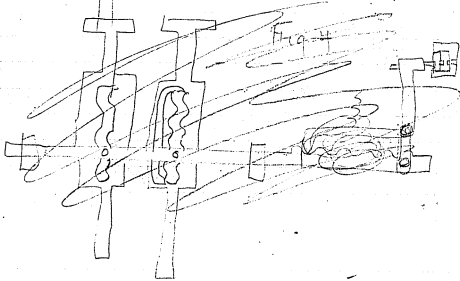
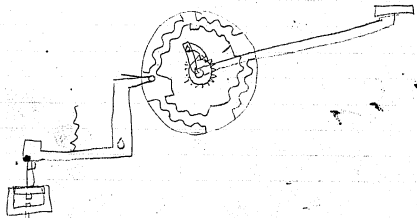


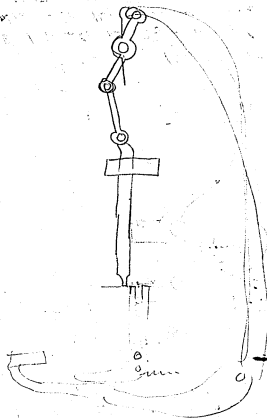
Fig 5



94

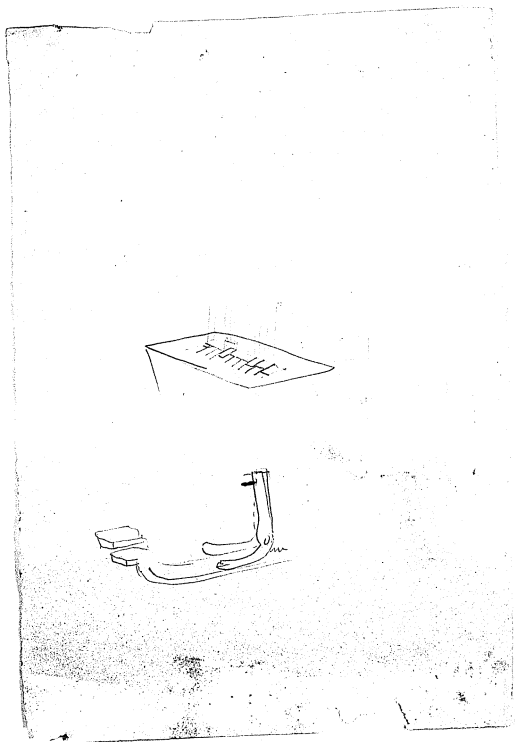
The principle of Whitworth Machine

①-36



95

95



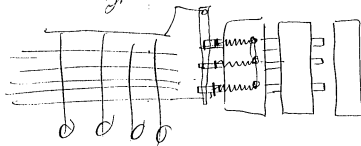


Thomas Hemitools  
Hemitools

Hemitools

Hemitools Hemitools

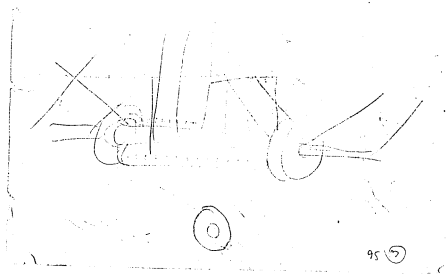
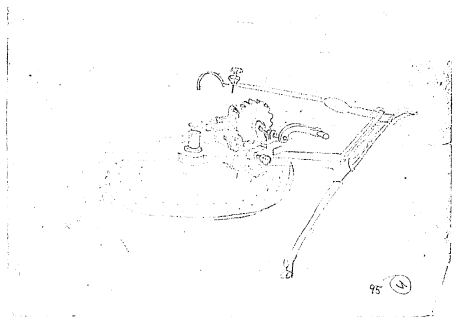
Hemitools  
Hemitools



95

w

95(12)



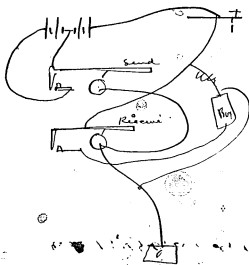
95

# Automatic Telegraph Company,

80 Broadway, Room 28.

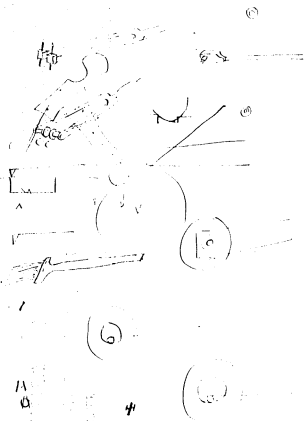
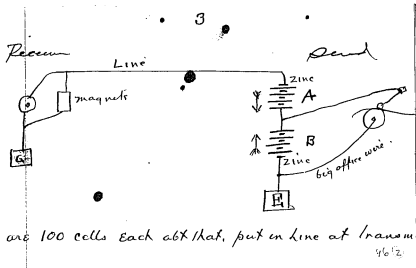
New York, *July 20 1874*

My Dear Captain



Statistics -

India Call 1600 to 2800 average 10 up  
 from 1 single message may be down at 15 w mi  
 Red Sea Call then about 7 one reading etc  
 has 145 Gelta Copp 180 1400 miles long  
 Lisbon to 800, and 13,450. words on day

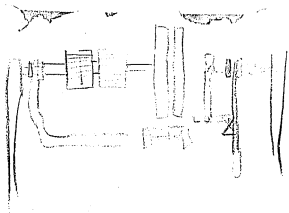


9623

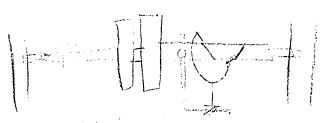
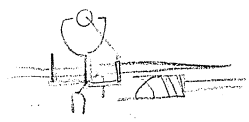




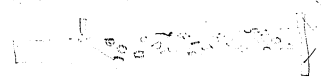
98



98

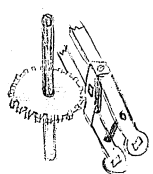


98



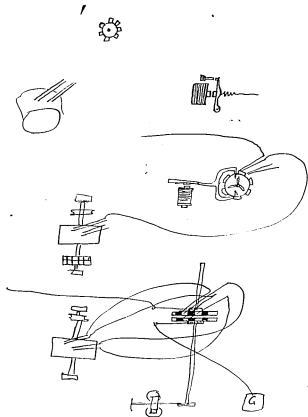
98

98



98

① 66



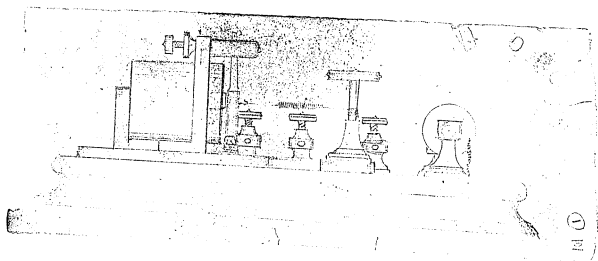
99











101

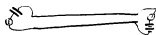
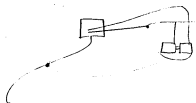


Secondary Current is enormously increased as it now encounters passes in a circuit of low resistance, consequently, the speed will be greatly reduced.

The disturbing effect of this secondary current is most strikingly apparent when an ordinary Morse relay is shunted with a throat resistance about signals which were previously clear will on the addition of the shunt will be scarcely readable.

It is obvious that this is not the system used by the Automatic Telegraph Company

On the same article and in other issues which have appeared since that time, Mr Little speaks of his ~~Canary~~ colored chemical paper as a great adjunct to his system. As my patent for this solution has at my request been retained in the Patent Office, Mr Little is unable to give the formula of his paper to the readers of the telegrapher but will probably do so when the patent is issued. The appellation of Canary Colored paper which he gives it

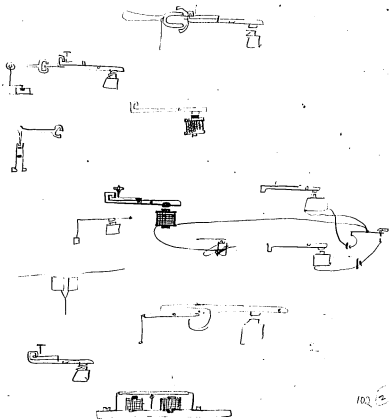


Kenyon Camera

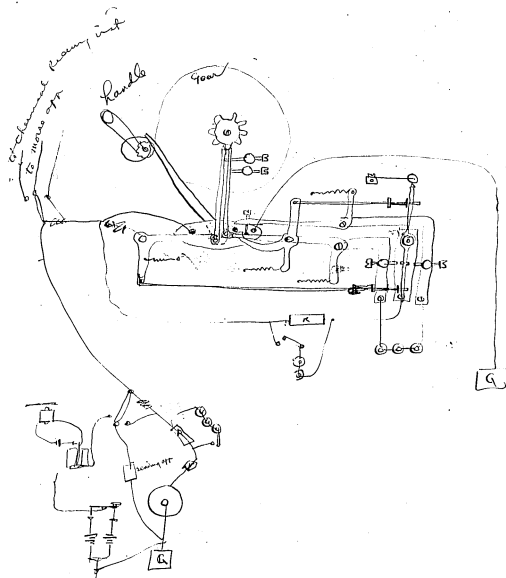
Kenyon Camera

Kenyon C

102



102



103 (1)

103

## 1 Duplex

The Duplex principle was invented by Dr Gentl. ~~The first practical Duplex was invented by Mason & Frazer of Boston in~~ But the modern Duplex and the one which But the first practical Duplex was invented by E. B. Mr Stearns of Boston.

Its Duplex instrumentation is one of considerable importance at the present time and a branch which illustrates the vast number of combinations which may be made to produce the same result and the explanations it gives to several phenomena hitherto not well understood will be my excuse for the great <sup>length</sup> number of pages devoted to this subject

103 (2)



OFFICE  
 Automatic Telegraph Company, p. 704

No. 80 BROADWAY.

New York, 1897

Page 2.

Stock of said Co.

of the 1000000. The stock to be  
 appraised as follows.

Edison equity, for patents now & to be  
 obtained relating to this branch of  
 light business and for services  
 as Engineer to be performed as well  
 as facilities of manufacturing  
 as to receive. \$250,000.

5 incorporators, by paying into the  
 treasury <sup>\$15,000</sup> for initial expenses shall  
 receive \$30,000. Each. \$250,000.

James B. Edison.

Total

\$50,000.  
 550,000

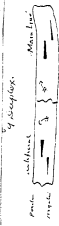
Remaining in treasury to be  
 for working expenses & some

Sold & money returned in dividend, etc

\$450,000.

Cities like Baltimore Washington,  
 Capital stock to be: 100,000.  $\frac{1}{3}$  to

go to the parent Co & to the  
 party or parties who initiate it &  
 place it on a paying basis. <sup>(1) X2</sup>  
 The balance to be <sup>given & incorporated</sup> sold, as <sup>working</sup> <sup>expenses</sup> <sup>the parent Co to furnish</sup>  
 paying each, 4000 <sup>expenses</sup>  
 No machinery, wire

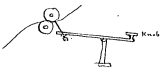


of telegraph

106

### System of Chemical Telegraphy

For the preparation of the transmitting paper I used a Morse ~~to~~ Embossing Register or Machine, operated by a battery and Key, ~~or~~ or directly without the battery by placing a Knob upon the embossing lever and ~~and~~ simply Embossing the dots and dashes by pressing upon the Knob, ~~the~~ difference between the ~~dots and dashes~~ ~~is~~ ~~in~~ ~~the~~ ~~use~~ ~~of~~ ~~the~~ ~~same~~ ~~key~~ I emboss two lines - the use of which I will presently explain.



I have already I am at present experimenting upon the application of a Key board to the ~~same~~ embossing device whereby any character is embossed by the depression of a Key, and therefore do not wish to confine myself to the above devices for the preparation of the paper,



2

in the telegraph for Dec 20 1873,  
 Two systems are described the first is the  
 Chemical system, the second the Ink Recording  
 System, In the Chemical system Mr. Little  
 claims to obtain great speeds by ~~the~~ <sup>the</sup> ~~the~~  
~~application of the magnetic instrument & a chemical~~  
~~cellular in contact with the recording station~~  
~~and a Condenser. Both notes on which.~~  
 But unfortunately for Mr. Little in his utter  
 ignorance of the the direction of the flow  
 of the inductive current, from ~~the~~ <sup>the</sup> Condenser  
 he has got it hitched on in the wrong  
 place, and actually increases the electrostatic  
 Capacity of the line just what the claims  
 to prevent, ~~in~~ <sup>in</sup> experiment made by  
 My assistant Mr. <sup>James</sup> Dalziel on the  
 Washington line soon after the publication  
 of the diagram, ~~showed~~ <sup>showed</sup> it was found  
 that with sensitive chemical paper  
 a speed of 160 words per minute could  
 be obtained without any apparatus  
 whatever, when the line was in a favorable  
 condition but on the addition of Mr  
 Little's ~~condenser~~ <sup>device</sup> the natural speed  
 was reduced to 75 words per minute.  
 Even upon a local circuit where an  
 unlimited speed can be obtained,  
 The addition of Mr. Little's invention  
 is a ~~disaster~~ <sup>disaster</sup>. It is evident



111 (0) 23

NEW

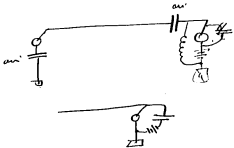
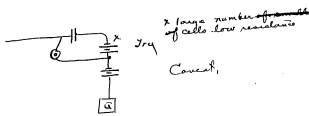
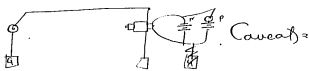
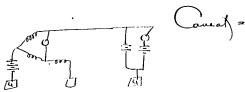
HERIT



106 ①

106

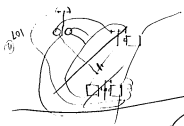
6.901



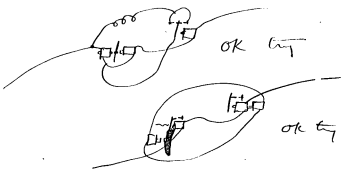
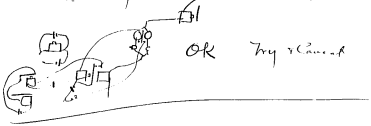
will be the effect of the leakage current numerous attempts have been made to render the effect of the leakage current negative on the receiving relay - among which may be mentioned Kearnes and Smith. Kearnes device is described in Dub Scheller and Sabine Smiths device is shown in fig -



A. is a relay magnet [ ] adjusted for distant signals B is another relay which may work an ink recorder or act as a sounder etc both are in the main circuit when the current detect the distant battery ceases the armature of the relay, A, flies a way from magnet and makes contact with the points F, and short circuits or shunts the magnet, B, by the wires C, D, when the distant current is on the relay lever of, A, is drawn forward the shunt is removed and the current due to the escape and distant current energizes the magnet - B - but a local might be passed through the magnet, B, and produce precisely the same effect and it still leaves the coils above enumerated untouched in this [ ]



107

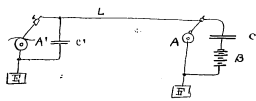


Another break for this purpose is shown in fig 21

$E$  is a vibrating lever having its ends insulated from its centre, & which is put in motion by a tooth wheel  $A$ . 1 2 3 4 are contact springs connected to battery as in Fig 21. The two ends of vibrating lever are connected to sounder in line. By looking at the figure it will readily be seen that when the lever is on the tooth of a wheel the battery is connected with the sounder through springs 1 & 4 & when it falls in the space, it is connected through springs 2 & 3 thus making reverse currents.

108

7 Cases.

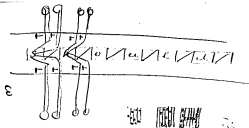


$A'$  is the chemical receiver instrument  $A$  the transmitting instrument,  $C$  a Condenser,  $B$  is the main battery,  $C$  a Condenser,

108

108

108



WE have not succeeded

*Billington*

XXXXXXXXXXXX

*Billington*  
*Billington*

WE HAVE immediate delay

*Bill*

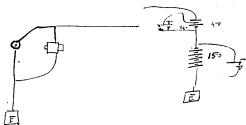
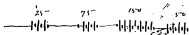
*Billington*

should not

*Billington*

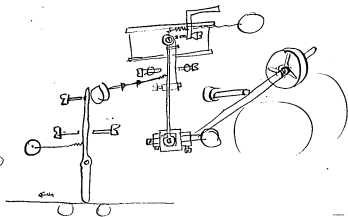
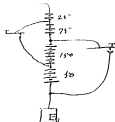
should not be *Billington*

111

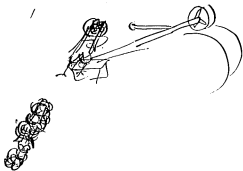


See.

...the twenty  
twenty  
...four eight



My pretty little friend  
I love you



111



Notes

= The vibrating levers of polarized relays should always be placed in a horizontal position otherwise <sup>the</sup> ~~which~~ presents to a great extent the effect of gravitation which if the direction force of the permanent magnet ~~is weak~~ <sup>is</sup> placed perpendicularly and not perfectly balanced the lever is apt to throw over on one side when the permanent magnetism is weak.

= In the compass form of galvanometers the needle is sometimes found to stick to the glass ~~metallic~~ ~~concrete~~ without any apparent reason. The cause of this is the Electrification of the Glass plate by brushing away with a cloth. The glass may be discharged by laying the flat of the hand upon it.

= The spark due to a great number of magnets in a circuit of low resistance may be almost entirely prevented by shunting each magnet with a condenser of two plates one foot square each.

Small rounded platinum points make better contacts than large flat ones because <sup>with</sup> the former there is a clearance for the oxide due to the spark, while the oxide on the latter accumulates and prevents perfect contact. The amount of oxide greatly is greater when the platinum is soft and ~~is~~.

Platinum may be drawn nearly as hard as steel, it follows that this it should always, <sup>112</sup> be used hard drawn <sup>to duplex</sup>.

at the distant end is connected or disconnected by the battery G. The relay still responds to the current of the distant battery. So far this method answers for short lines ~~up to~~ <sup>up to</sup> ~~of~~ <sup>of</sup> 80 and 100 miles, but on longer lines another interfering cause arises which called static induction and the object of the Condenser C is to compensate for this phenomenon & preserve the balance necessary to perfect signalling. <sup>112</sup>

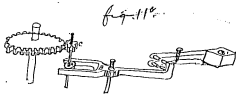
112

113  
 12 sk wheel  
 length of contact will shorten  
 as the point of contact

The most perfect break in a mechanical point of  
 contact  
 is that shown in fig 11. This  
 is specially applicable to high speeds



114



~~As with other breaks the~~  
~~tooth length will vary with~~

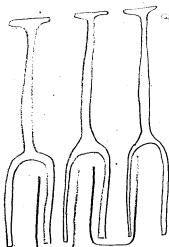
The Contacts are made as in fig 10.  
 But the toothed wheel which gives  
 motion to the vibrating lever the length of  
 vibration of which will vary as the  
 rapidity of rotation of the toothed wheel  
 increases, it is replaced by a gear pair  
 + Cam wheel. A is the Cam wheel or  
 Eccentric wheel working in the forked arm  
 113

113



process for dissolving the cellulose by

Ref



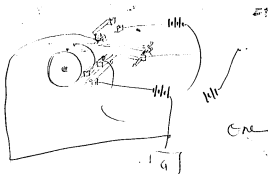
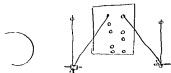
113

113 ②

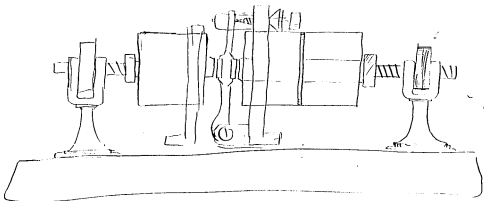
113 ③

process for describing the cellulose by

114

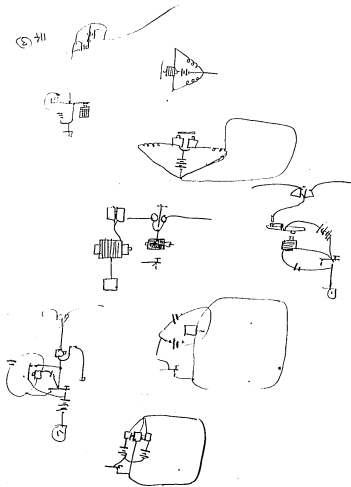


114-①

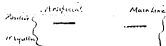


114-②

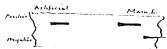
114



7 Duplex.

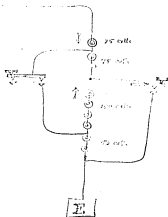


If the main line has considerable electrostatic capacity the record will be as shown in fig on closing and opening



115C

0.0025 sec 25 ohms per inch  
" 1.00 sec 75 ohms per inch



115D

115

50 ohms ground  
27 ohms  
16 ohms total circuit  
281 ohms  
or in a 100 ohm leg  
75 ohms

Breakwheel for reversed currents  
with 2 batteries

A is a tooth wheel on which the levers  
D & C alternately make contact & <sup>the</sup> battery so  
placed that when one is on a tooth the  
other is in the space; as will be seen by  
the connection of the two batteries in Fig 16  
when C makes contact a negative current  
B makes contact a positive current is  
thrown to line. These break are liable to  
same defect as single current breaks

Fig 17 shows another method

B is a tooth wheel giving motion to  
the vibrating lever C which carries two  
platinum points on its end. D & E are  
contact springs which rest against the  
flat pins on B. By the rotation of wheel  
B the lever C makes connection with  
D & E alternately throwing reverse currents to  
line

14

Breakwheel for reversed currents with  
one battery. Fig 18 shows a plan.

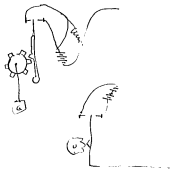
A is a tooth wheel which vibrates two  
contact levers C & B one of which is on a tooth  
when the other is in a space. Thus when  
C is on a tooth the point E is not in contact  
& B being in space point D will send a current  
to line, & when B is on a tooth & C in space  
contact made at E will send a reverse current

Fig 19 shows another method:

In this plan F & G are 2 contact springs  
one connected to each end of a battery &  
resting against the contact pieces B & D. The  
vibrating lever C carries a cross arm C on its  
end which when it vibrates disconnects  
F & G alternately from their respective contact  
pieces throwing reverse currents to line.

15 (A)

115





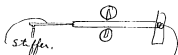
OFFICE  
Automatic Telegraph Company,

No. 90 BROADWAY.

Page 4.

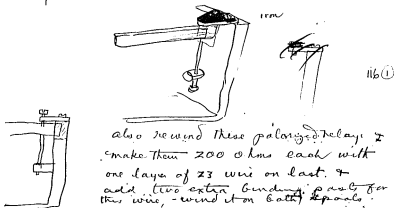
New York. 187

These polarized relays are to have stiffer  
brass longie projections



Platina points to be of hard drawn platina

pevald thus



also rewind these polarized relays &  
make them 200 ohms each with  
one layer of 23 wire on last. &  
add two extra binding posts for  
this wire, - wind it on both spools.

116

various  
which there is  
that it passes  
of process entirely  
easier of solubility and  
" " acid in the first  
several foreign metals  
iron etc which

1 a sulphur

OFFICE  
Automatic Telegraph Company,  
No. 80 BROADWAY.

Page 3.

New York, 1897

to be the same as an ordinary morse relay  
of if this be inconvenient to obtain the  
resistance required, then diameter may  
be the same as a Duplex Spool,  
The platin points to be small and with  
hard drawn platin, the platin used  
on previous instruments is so soft that  
it creates too much oxide,

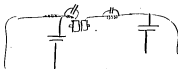
Three of these relays are to be made,

four more shortened sounders  
like sample,



117 ①

117



Radical acid contains more C than any other known organic compound. It is also the most powerful  
 reagent for acids. Those which contain C<sub>2</sub>H<sub>3</sub> or C<sub>2</sub>H<sub>5</sub> or paraffine acids.

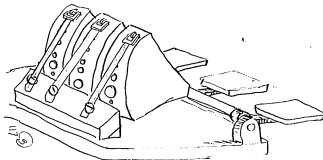
Radicals or elementary Organic Radicals, consisting of Radicals of Hydrogen and  
 Oxygen for acids. Those which contain C<sub>2</sub>H<sub>3</sub> generally with an acid or anion  
 which contains C<sub>2</sub>H<sub>3</sub> and in one or two acids.

Many oxides and acids contain water, especially Oxalic acid, that it cannot  
 separate from the acid by heat, and acids like H<sub>2</sub>O of Hydrochloric or Sulfuric  
 the place of a base. As it acts like an oxide that would form a salt  
 not form off until a strong salt-sulfuric base such as KO<sub>2</sub> P<sub>2</sub>O<sub>5</sub>  
 is introduced a mixture of heat appears varying according to the value  
 in which case after the H<sub>2</sub>O has been expelled a compound of the base O  
 acid with the base remains. These lowest state of hydration to be  
 acid can be brought to Glacial acetic acid. This formula is  
 but combined to form oxides of potash we have KO<sub>2</sub> C<sub>2</sub>H<sub>3</sub> C  
 here it has 1 atom of H<sub>2</sub>O, and it is free in a substance of  
 when however it forms a radical H<sub>2</sub>O, C<sub>2</sub>H<sub>3</sub> O, hence pure acid  
 acid no oxygen in the dry residue of KO<sub>2</sub> must be C<sub>2</sub>H<sub>3</sub>O  
 acetic acid Anhydride consists of an elementary radical C  
 Acetyl". C<sub>2</sub>H<sub>3</sub> combined with 3 atoms of O, to form one  
 of this compound radical C<sub>2</sub>H<sub>3</sub> is called Ac then use  
 the similarity between Organic and inorganic acids, then A  
 H<sub>2</sub>O, SO<sub>2</sub>, acetic a. H<sub>2</sub>O, AcO<sub>2</sub>, Sul. potash H<sub>2</sub>O SO<sub>2</sub>

Put H<sub>2</sub>O, AcO<sub>2</sub> generally these elementary radicals are  
 obtained with separate salts, and they are called C<sub>2</sub>  
 when separated from them other bodies, just as acetic  
 Nitric acid is introduced in the separate state, yet it  
 is normal - With in a foot note says that the new  
 Organic radicals known to exist on a scale is a  
 widening. Radicals are capable of taking up more than  
 atom of O. Nitric acid contains besides the radical N,  
 atom of O, the oxide Oxalic acid, Radicals are  
 compounds, in which all the properties of the elementary bodies  
 separated several of them as cyanogen plays the part of a  
 organic other such as methyl, benzyl, resemble elements  
 In mineral chemistry the radicals are simple inorganic  
 in one compound.

Gray Cast iron when nascent Hydrogen is evolved over it  
 from gases an oil, Vol. I. Organic p 39.

117



117

Working Model of a Perfector claimed and believed to be the invention of Mr J. S. Grass was brought to my office during the latter part of November or early in December 1870 and left with me to await the result of Prof A. Edisons attempts to ~~was~~ complete his invention of a perfector. Mr Grass claiming his Machine as equal to about twenty words and Mr Edison expecting from 20 to 30 words from his.

Remained with me until April 1871 when it was taken to shop in New York.

Edisons perfectors were brought to 64 Broadway

Grass Model for perfector for Patent Office was completed as per bill

Aug 12, 1871.

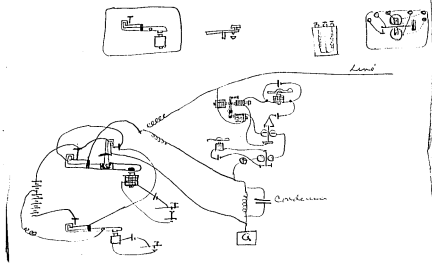
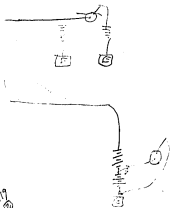
~~Edisons~~ <sup>Grass</sup> agreement with <sup>Grass</sup> ~~Edison~~ dated Aug 13, 1870

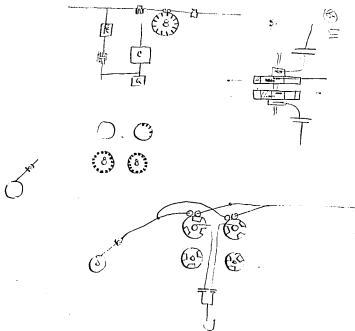
Grass agreement with Edison dated 3<sup>rd</sup> Aug 1870.

117 (8)













represent <sup>from</sup> this in this number the first of a series of  
the contents of a series of  
on duplex and quadruplex  
Valuable notes and original articles taken from the  
columns of the Operator, a publication devoted to telegraphy  
a journal which has been published in this city for  
a year past but which has just entered the  
field of science and of the represented articles  
as well as other original and valuable  
scientific matter which appeared in its  
first scientific number is to be taken as  
a criterion of what is to be in the future we  
bespeak for it a liberal patronage from  
the telegraphic fraternity.

We reprint in this number of the journal the first of a series of  
original articles on duplex and quadruplex telegraphy taken  
from the columns of the Operator, a publication devoted to  
a paper devoted to telegraphy  
a paper that has been published in this city for  
a year past, but which <sup>for the first time</sup> has entered  
the field of its special scientific subjects  
of science. If the represented articles as well  
as the other original matter which appeared  
in its first scientific number is to be a  
criterion for the future we bespeak it cannot

It will be unnecessary to describe the details of this class of break, as they are liable to the same defects as the Single Current Breaks,

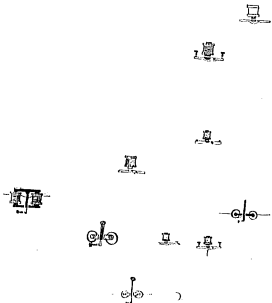
Fig. shows another method,

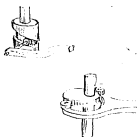
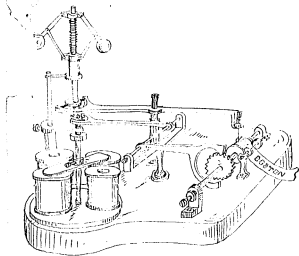


B is the rotatory wheel to give motion to the  
 Lever C, which is platinum tipped,  
 d e are two contact springs, which  
 may be locked as in fig  
 resting against the stop pins n m;  
 By the vibration of the lever C  
 against one spring & the other the  
 Lever C Battery is thrown alternately  
 in the Circuit.

120<sup>(2)</sup>

121





122

4

**CUPRO-AMMONIUM** - Dissolve Young bone or any variety of lignite, and all of the rest of a yard or more  
Very common compound. 122 2

4 lbs Concentrated aqueous Ammonia 880 specific gravity

122 2  
Glass bottle of a size which will be half full when the ammonia  
is put in.

Then immerse 8 copper-wires No 22 in the liquid.

It immediately becomes a blue tinge.

Take every 3 days or oftener for 6 weeks and allow very  
free access of air to it every time it is shaken, use as  
dark, at the end of 6 weeks is ready for use.

Stampan Adm p 101 April 19 1872.

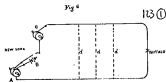
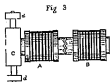
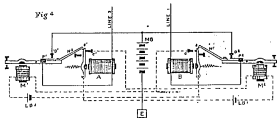
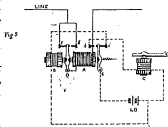
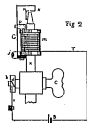
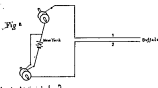
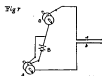
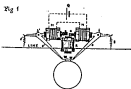
**PRUSSIAN BLUE**, is dissolved by rainwater acidulated with acetic acid

**MURCUD-TYPE**. Dissolve a small quantity of iodine, or platinum  
or other metals in Nitro Muratic Acid. Soak paper in  
this solution and hold it over the fumes of Mercury  
It instantly colors it black and is indelible.  
Harpur Mag May 1872 p 470

122 3



SUPPLEMENT TO THE OPERATOR.

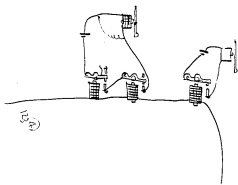
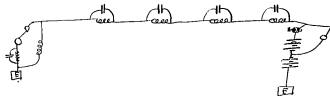


123

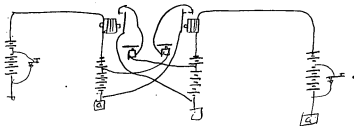
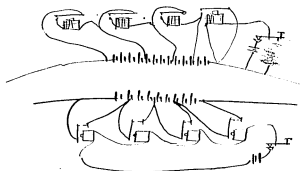
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(2) P21

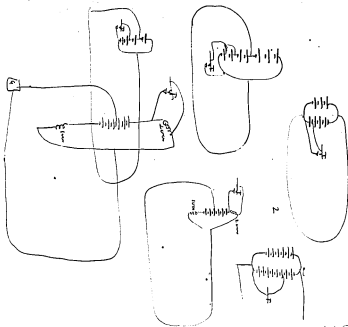


(3) P21



123

724



124 J



124 C

124

NEWARK, N. J.

50 W  
35 W

TO AMERICAN TELEGRAPH V  
MANTENERS OF  
TELEGRAPH MACHINES, SMALL AND ACCURATE IN  
No. 103 New Jersey

will submit the accompanying proposition  
to you many readers for  
solution.

Transmit into a closed circuit  
of any ~~resistance~~ positive  
and negative current  
from a non battery the copper  
one pole of the which are  
connected up with a voltmeter  
moving key to which no  
extra points or apparatus  
whatsoever are to be added  
No extraneous devices other than  
the simple battery and key are  
to be used except connection  
wires. I enclose a ~~number~~ diagram  
of the apparatus. I have a Edison  
Newark Nov 25-1874

See also  
Telegraphic  
Journal  
Electrical Review  
Vol. 9, 1877  
Jan. 15, P. 23  
H.C.B.

1800  
3700  
7000  
7200  
1800 10000  
7000  
7200  
14400  
12600  
15000  
72000  
7000  
72000

3 1/2 ohms  
7600  
Terms

1	15	600
	700	7
	10500	5600
	2400	7000
	12900	12000
	9600	
	22500	

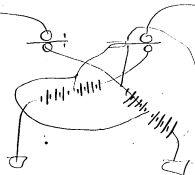


124

NEWARK, N. J., 187

30 W  
35 W.

To AMERICAN TELEGRAPH WORKS, Dr.  
MANUFACTURERS OF  
 TELEGRAPH MACHINES, SMALL AND ACCURATE MECHANISM,  
 No. 103 New Jersey Railroad Ave.



To the Editor of the Operator  
 I submit the following problem  
 to you many readers for  
 solution.

Transmit into a class of circuit  
 of any amount, positive  
 and negative current  
 from a new battery the upper  
 and poles of the which are  
 connected up with the ordinary  
 number; and with a common  
 messenger to which no

extra points or apparatus  
 whatever are to be added.  
 No instrument devised other than  
 the simple battery and key are  
 to be used except connecting  
 wires. I enclose a circuit diagram  
 showing the arrangement.  
 Yours truly,  
 R. A. Schuman  
 Newark Nov 25 1874

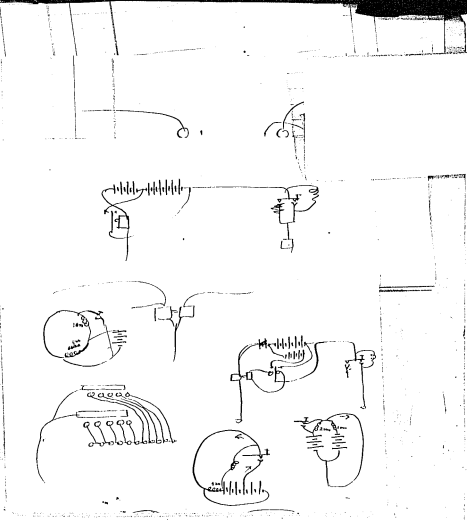
See also  
 Telegraphic  
 Journal &  
 Electrical Review  
 Vol. 2, 1875  
 Jan 15, P. 23  
 H.C.B.

1000  
 54.00  
 4.00  
 67.00  
 72.00  
 18.00  
 10.00  
 7.00  
 18000  
 7000  
 15000  
 14400  
 12600  
 7200

Tenn.

1	15	500	124
	700	7	0
	10500		
	2400		
	12900		
	9000		
	22500		
		5600	
		7000	
		12000	

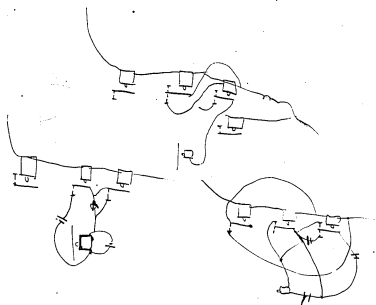
124



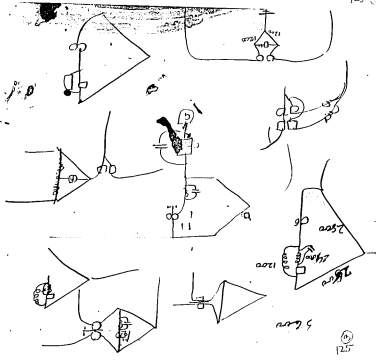
See also  
Telegraphic  
Journal &  
Electrical Review  
Vol. 2, 1875  
Jan. 15, P. 23  
H.C.B.



125



521



521

Fig 11

521

ell

NEWARK, N. J.,

TO AMERICAN TELEGRAPH WORKS  
 MANUFACTURERS OF  
 TELEGRAPH MACHINES, SMALL AND ACCURATE MECHANICAL  
 No. 103 New Jersey Railr

Terms,

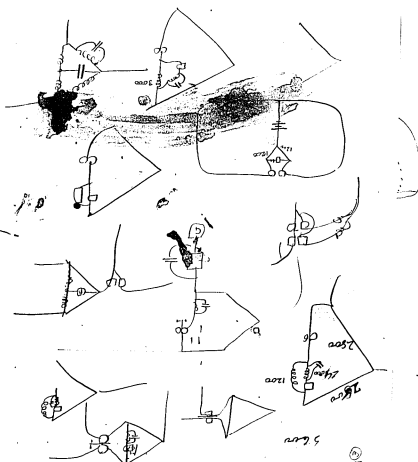


Fig 11.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

125

125

125



*611*

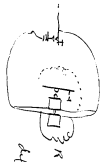
NEWARK, N. J.

187

125

To AMERICAN TELEGRAPH WORKS, Dr.

SM,  
Mad Ave.



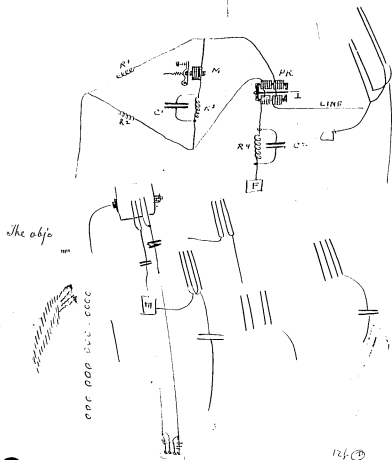
*by H.*

*difficult*

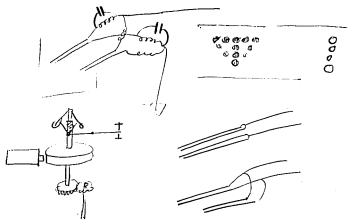
**125**

125

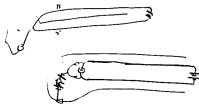
THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1



126

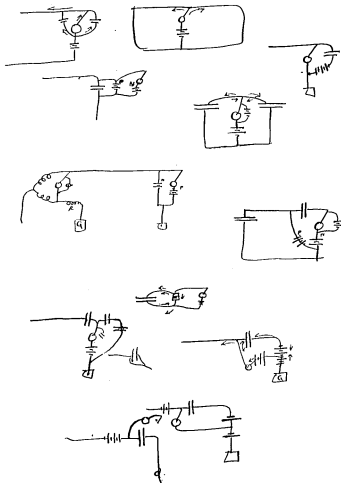


IMMEDIATELY  
COME HOME TO



126





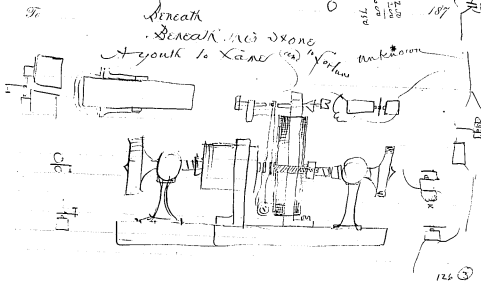
126

Philadelphia:  
310 CHESTNUT STREET.  
Washington, D. C.:  
1409 PENNSYLVANIA AVE.

WILL PLEASE SEND  
THE FOLLOWING  
FROM WASHINGTON, D. C.

Geo. Harrington,  
PRESIDENT.

J. C. Reiff,  
Treasurer.

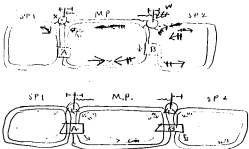


126

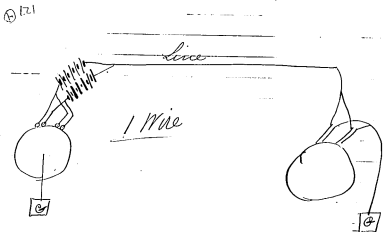


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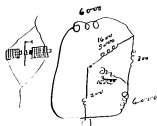
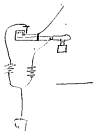
above station is <sup>13</sup> pulled ~~down~~ <sup>up</sup> by the bucket & the  
 distant station is pulled by the air for the  
 signals from the distant station are pulled inside  
 by the bucket at that and the home station,  
 the Water Supply diagram will clearly show how  
 the effect is obtained.

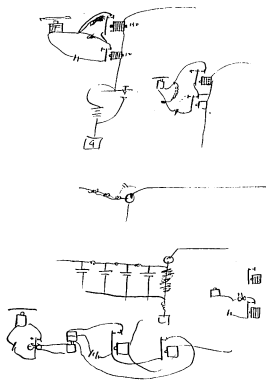


when no water passes from the reservoir A through  
 the main or secondary pipe the water from B passing  
 through the main pipe M.P. causes the level  
 of  $x$  to the left, and the level on the right is close  
 to  $x$  to speak, but as explained before the bias  
 of water wheel W remains unaffected  
 if now water is made to pass from A into  
 the main secondary pipe, as shown in the  
 direction indicated by the unfeathered arrows  
 the water the stream of water will not against  
 the stream from B and as both stream  
 the water will become still the effect of this would  
 be to allow the level of  $x$  to be drawn to the  
 right, were it not for the fact that now



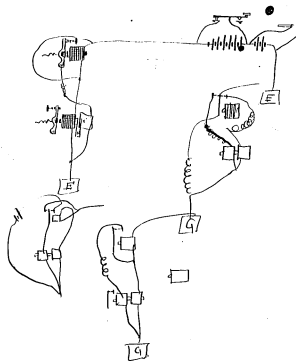






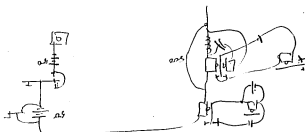
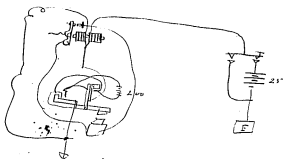
① 127

② 127





128



128

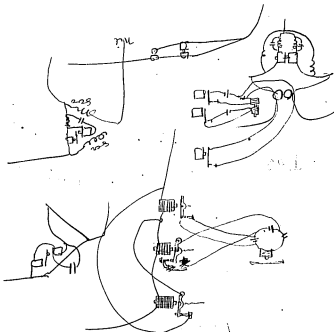
THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

Terms

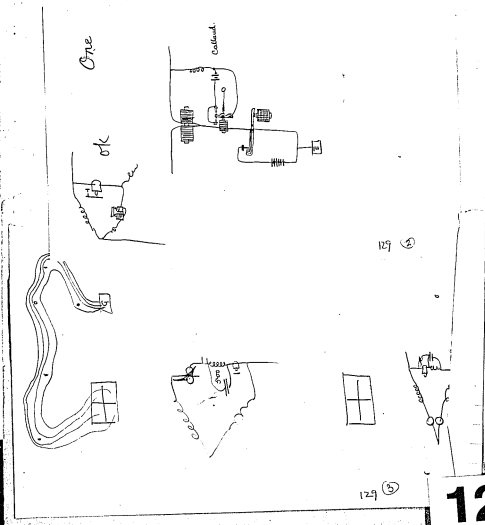
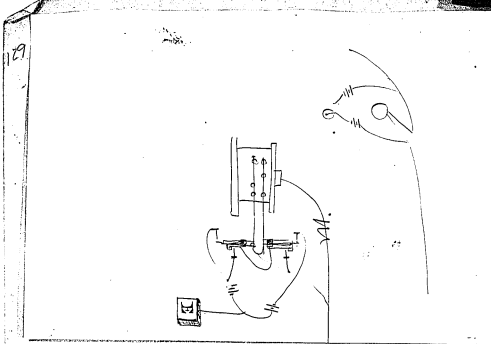
TO AMERICAN TELEGRAPH MACHINES SMALL AND MEDIUM SIZES

No. 19

NEWARK, N. J.

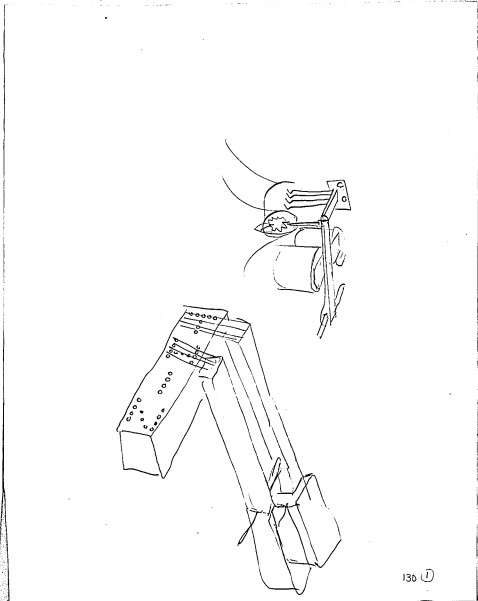


128 (3)



129

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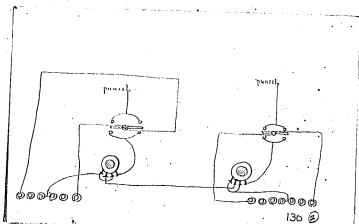


130 (1)

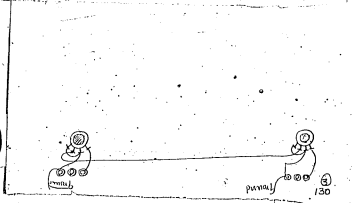
130



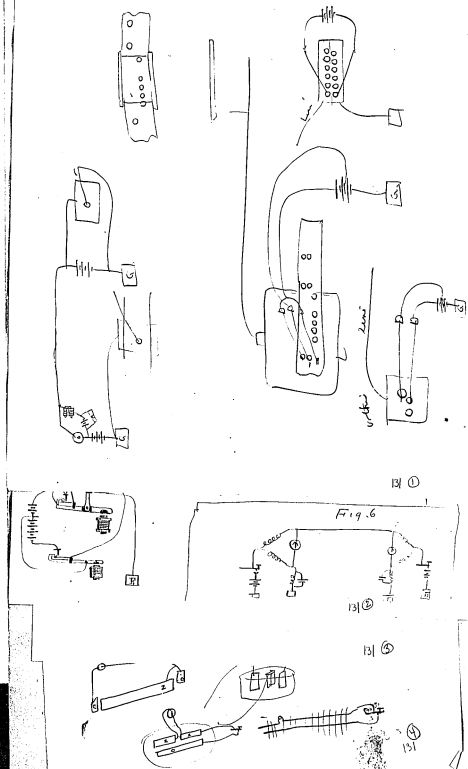
130 (1)



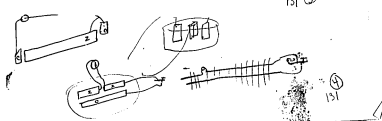
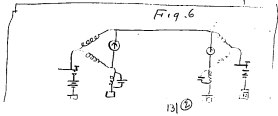
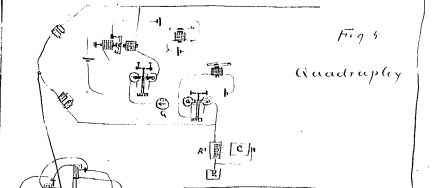
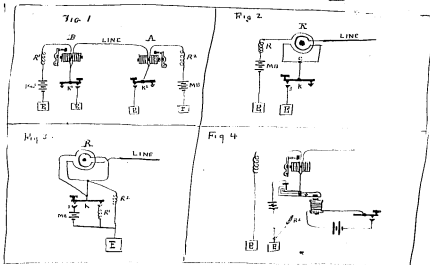
130







131



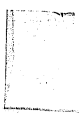
1 side -  
1500 -

#13-

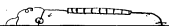
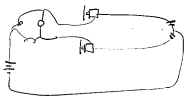
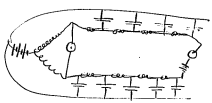
~~1 side~~  
1 side



~~1 side~~  
1 side



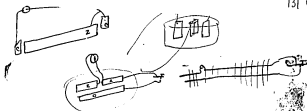
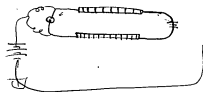
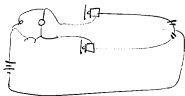
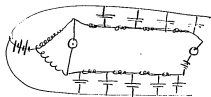
THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1



131

1/16" sheet four leads

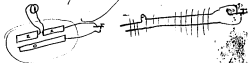
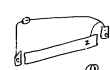
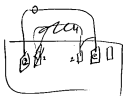
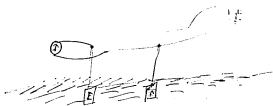
50



131

131

131





132

Quadruply - wire crossed - 132 ①

JOURNAL OF THE FRANKLIN INSTITUTE,  
EDITED BY...

Philadelphia, Nov. 30, 1871

My Dear Sir -

It occurred to me while ransacking the remarkable little instrument of yours - the photograph - at the Franklin Institute Exhibition this evening, that perhaps you would be willing to call on it, and show it to the highest scientific body in the country, the National Academy of Science, of which Professor Henry is President, now in session in this city. Mr. Eastwick was good enough to say he would send you a message from me, and I write on it to send this letter to explain matters more fully.

The first notice I saw of your curious discovery was in the London

... of your discovery...  
... a scientific journal of your...  
... pointing bearing in many di-...  
... tions. But I have had it in...  
... in two lines to write and...  
... to prepare me an article...  
... line, formal describing it and...  
... possible, illustrating it. Since...  
... I guess I have now to make, if...  
... you really cannot do it, may you...  
... please me in possession of the...  
... plate & material, so that I can...  
... make up a paper on it.

I am very anxious too, that the Franklin Institute should recognize the merit of this discovery and properly reward it. As a member of the Board of Managers I shall be very glad to do what I can towards this end, so that

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# 132

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above named student, and to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, the Professor of Algebra in the University of the Republic (Buenos Aires) and shall be glad to receive your letter on coming to the home, 4th of May, 1911.

Trusting that you will be able to find the necessary information and records, I am, Sir, very respectfully,  
 Yours very truly,  
 Carlos H. B. de...

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

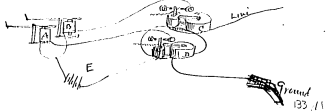
V. A. C. de...

Lifferts Patent  
Translating System

- 7 This invention consists in the combination of several devices for preparing Rapid recording, and recording in such a manner that the paper can be run through a second machine, and the recorded dots made to translate themselves into Roman Characters, and be printed upon a slip of paper by this machine,

~~There are three machines~~ The recorder is, <sup>similar to</sup> an ordinary morse register, with the exception that it is provided with an extra embossing point lever, and electro-magnet, These levers are so arranged that when one is brought to the face of the paper for an instant a dot is embossed in the paper on the right and when the other lever is raised in the same manner a dot is embossed on the left. So that a character is formed of dots on the right, left, or right & left,

The electro-magnets which operate these two levers are placed within a local circuit and connected to two very quick acting polarized relays Thus



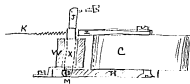
133



A and B are the electro-magnets which operate the two levers, E is the local battery, C and D are two polarized relays built within the main circuit and are operated by currents of different polarities sent from the main station at the other end of the line one relay responding to a negative current and its armature closing the local circuit of one of the electro-magnets operating the embossing lever, and the other responding to a positive current and closing the other electro-magnet of the other embossing lever, I employ a large and powerful local battery so that the large amount of force will be enabled to make the levers do their work promptly and make them follow the rapid vibrations received upon the relays.

These relays may be operated by perforated paper in the usual <sup>way</sup> or by any special mode,

The relay magnet is of peculiar construction



W is a small helix in which is kept a constant current, this <sup>at M</sup> polarizes the iron tube X, pivoted upon the iron arm proceeding

# 133

from one end of the magnet. <sup>3</sup> This vibrating tube lever is drawn back from the pole Z of the magnet C by the spring K - The coil of magnet C being connected with the main line and the local constant battery to the polarizing coil W it follows that if a negative current (in the case may be) is sent through C, it will attract the tube X and close the circuit as before described but if a positive current is sent the magnetism in arm Z + H will be the same as in the tube and the effect will be neutralized, and the tube X does not move, the use of the spring is to pull the tube back after a current has been sent and the tube attracted. I also employ only one spool instead of two so as to get the magnet as short as possible, so that it will charge and discharge with rapidity. I make the armature of a tube for the reason that it will be much lighter and act much quicker and still have the required strength - I do not wish to confine myself to any particular form of one single spool as an ordinary magnet may be replaced the spool. C.

I claim, <sup>1st</sup> A polarized relay constructed substantially as described

2 Combination of a double <sup>pennd</sup> embossing register with two polarized relays.

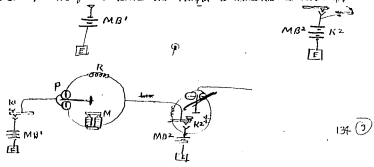
3 Operating the Relays and Register in the manner set forth a

133

Simmons

P is an ordinary polarized relay, the main lens  
 core being attached to the wire connecting the  
 two springs together. M is an electromagnet  
 having a resistance equal to that of the  
 polarized relay, at P. R is a constant  
 resistance which is so adjusted that when  
 the current is permanently closed when  
 equal to the polarized relay.  
 When the current of the line is  
 permanent both the keys, K<sup>1</sup> K<sup>2</sup> are  
 closed. The main current from the  
 main battery pass over the line  
 but produce no effect upon the  
 polarized relay for the reason  
 that it is balanced in the lens  
 cores of the polarized relay,  
 but the magnet M, is not so balanced.  
 If now the current of the line be  
 interrupted in opening either key  
 the magnet M induces current  
 from the magnet M circulating  
 when the closed current of low  
 resistance formed in the polarized  
 relay P. R is so chosen that the  
 current throws the polarized  
 relay to one side, if the  
 key for current is now closed.

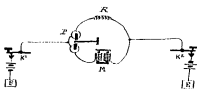
relay. R is a resistance also equal to the  
 relay. When both the keys, K<sup>1</sup> and K<sup>2</sup> are closed the  
 current from the main battery pass over the line  
 but produce no effect upon the relay when the  
 current is permanent the tongue of the relay will  
 remain on either side, as the main current in  
 passing through the lens core, in opposite direction  
 produce no magnetic effect. But the Magnet  
 M is not so balanced, hence when the  
 current is interrupted by either key the secondary  
 current from M circulates within the  
 closed circuit formed by the relay P and R  
 and upon the former and the tongue is thrown to



THE REDUCTION RATIO FOR THIS DOCUMENT IS 10:1

On a new method of working polarized relays  
 By J A Edison

By means of the arrangement shown in the accompanying diagram any number of polarized relays may be worked on closed or permanent circuits.



P is an ordinary Siemens polarized relay, the main line wire is attached to the wire connecting the two spools together. M is an electromagnet having a resistance equal to that of the polarized relay. R is a resistance also equal to the relay.

When both the keys K1 and K2 are closed the current from the main batteries pass over the line but produce no effect upon the relays unless the current is permanent the tongue of the relay will remain on either side, as the main current in passing through the two coils in opposite direction produce no magnetic effect. But the magnet M is not so balanced, hence when the main current is interrupted by either key the secondary current from its coil acts within the closed circuit formed by the relay P and resistor R and the tongue is thrown to the side when the current and the tongue is thrown to the side.

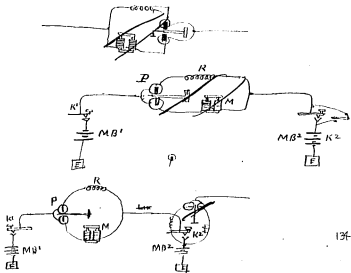
134



On a new plan of working, Polarized  
relays. By T. A. Edison;

By means of this arrangement the a  
advantages of number of Polarized  
relays may be worked on closed  
circuit; (1\*) with permanent currents,

134

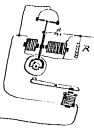


LINE

Printing Device 1.

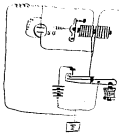
Prints both on open & closed

LINE



Printing Device 2.

135 (1)



Device 3



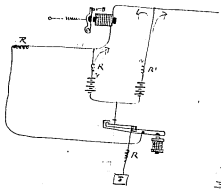
135

135 (2)

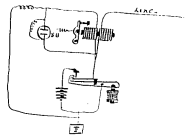


DUPLEX-220

135 (3)



Device 4



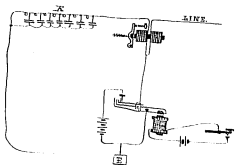
Device 5



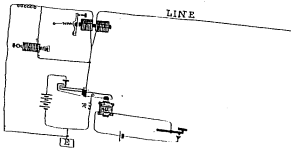
135

135 (2)





**135**



DUPLEX-CO.



136

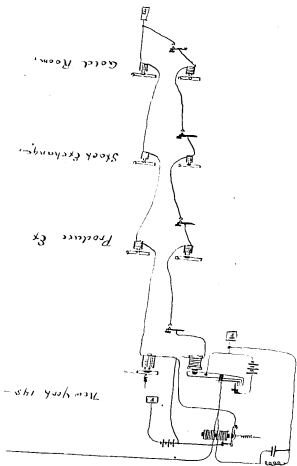


Figure 1

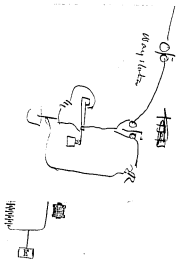


Figure 2

136 (2)

136 (4)

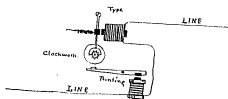
136



136

1864. Richard A Brooman. Specification N° 1720.

Principle



Rotates type wheel by a weak current, prints by increasing it.

B. 2

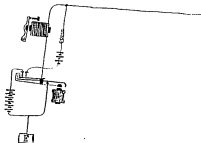
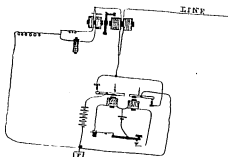


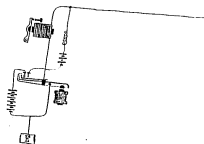
Figure 15

136 (D)

**136**



2.5000 144



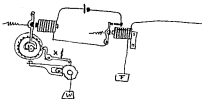
2.5000 144

136 (D)

137

1887. Barnes. Specification No 1183.

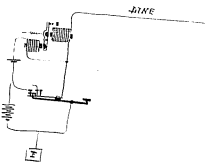
## Principle



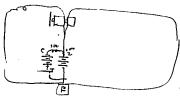
Prints & rotates Type W. by clockwork - printing prevented when type wheel is rotated by a click being placed in the path of a toothed wheel on the type wheel shaft, on ceasing to rotate the click drops in between the teeth & releases the clockwork which operates the printing lever.

137 1

137

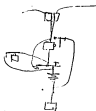


137 2,



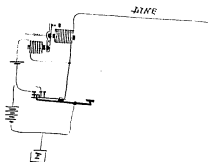
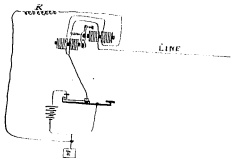
Page 1

Dup Dec 137 3

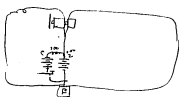


137 4

137

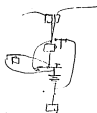


137 2



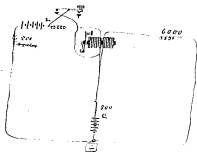
Page 1

Dep Sec 137 3



137 4

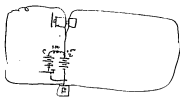
137



*Duplex Dev 1*

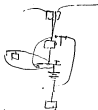


*Dup Dev 2*



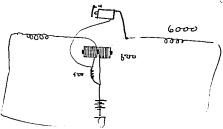
*Page 1*

*Dup Dev 137 3*



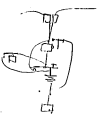
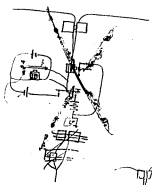
*137 2*

Page 2



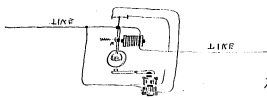
Dep New 4

137



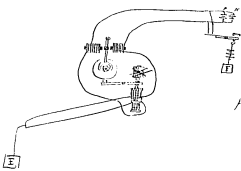
137 (B)





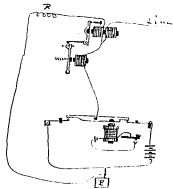
Principle Diagram 3.

Armature polarized - only responds to A. Current.



Principle 4.

138(D)



Principle 11

138 (2)

138

Samuel A. Kery

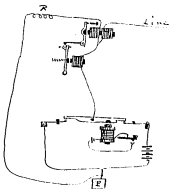
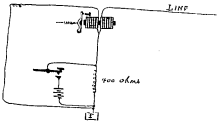
138 (3)



138 (4)

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

138



138 (2)

same as fig

138 (3)

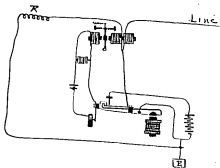
E

E

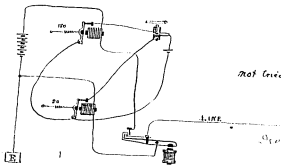
138 (4)



138



Scheme 11

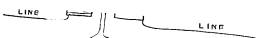
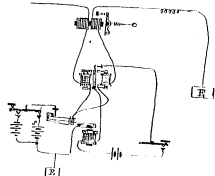


not tried yet

Scheme 12

139

Same

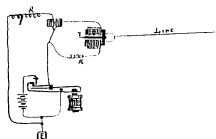


Type W related by Clockwork

X is a water valve or cup. The rotation of the type keeps the lever N - float on top of water, and the printing clockwork is locked. When the type is stopped the lever N is free to go between the teeth of a wheel on the same shaft as the type wheel, it does not do it instantly as the float takes some time to sink when it do reach the bottom it releases the printing mechanism

139 ②

# 139



Device of

139 ③



139 ④

... moved by clockwork

139 ⑤

1845 Brett, Specification No 10,939.

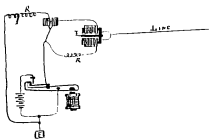


Type W regulated by Clockwork

X is a water valve or cup. The rotation of the type keeps the lever N on float on top of water, and the printing clockwork is locked. When the type is stopped the lever N is free to go between the teeth of a wheel on the same shaft as the type wheel, it does not do it instantly as the float takes sometime to sink when it do reach the bottom it releases the printing mechanism

139 (12)

139



Answer of

139 (13)



139 (14)

worked by clockwork —

139 (15)

139

8a

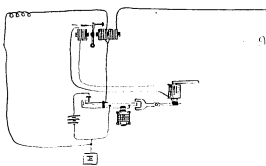


Figure 8

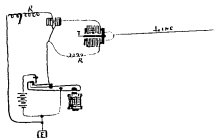


Figure 7

139

139 (3)

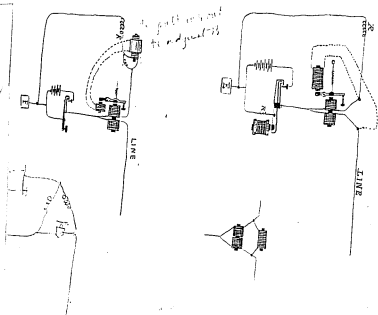


139 (4)

... worked by clockwork —

139 (5)

139



THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

139 (d)

139  
⑤

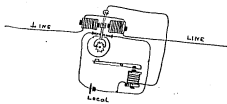
worked by clockwork —



139

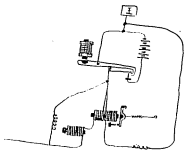
1865. Clark, [Boyles English] Specification No 2356.

Principle

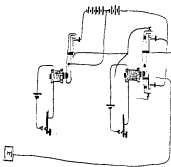


Type wheel & printing worked by clockwork —

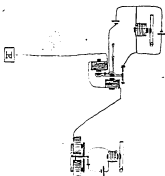
140



140 (3)



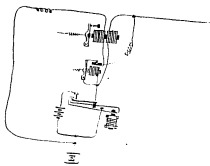
140 (2)



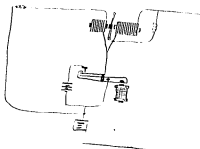
140

2

140

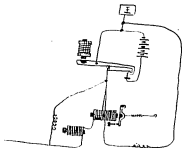


Device 2



Device 1

140 (2)

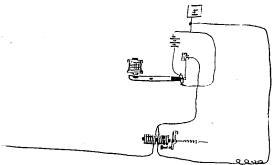


140 (3)

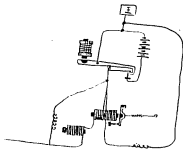
△ = 1  
/ = 1

140

*1. 10.10.20*



*2. 10.10.20*



$\frac{1}{2}$   
—  
—

140 (3)

140

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

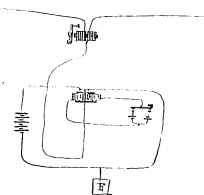
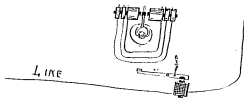
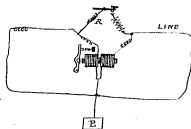


Figure 11

140 (A)

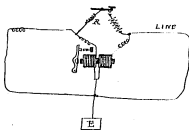
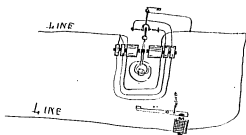


140 (B)



140 (C)

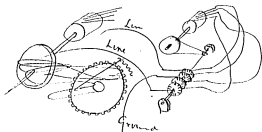
140



140 C

140 D

Circuit 2



Use Roman perforations with letters formed with four lines, and two line wires. At the sending station the roller pens <sup>two</sup> on one line and <sup>two</sup> on another. Send P4N Currents over each wire as was described in former Circuit. At receiving station ~~there~~ is same arrangement of pens one pen of one wire being set ahead one half <sup>143</sup> of other pen of same wire, owing to the conductivity of the

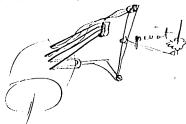
of the chemical paper I get  
a Crossfire of Current from  
one set pens to other as  
already described in former  
Circuit - The Circuit is to  
show a plan for observing  
the Cross fire.  
In receiving besides the rotation  
of the Drum Carrying the paper  
there is a secondary apparatus  
drawing from Contact wheels  
& Contacting springs. Which  
revolve several times faster than  
the Drum Carrying the paper.  
These <sup>contact</sup> points are so connected to  
the receiving pens that in  
rotating the line connection is off  
Each set of pens is independently  
broken & closed with immense  
rapidity relative to the line vibration  
The ~~ground~~ one line being disconnected  
from its set of pen while the  
other line is in connection with  
it set and vice versa.



so that at no time are more than  
one set of pens recording. The  
other gear having no connection  
at that instant with any  
source of electricity ~~and hence~~  
no cross fire is possible,  
When the contact is broken  
5 times as fast as the main  
circuit the ~~writing~~ ~~so~~ letters  
recorded are nearly perfect.  
I do not ~~wish~~ wish to confine  
myself to this mode of  
operating one set of pen  
operating while the other  
set is & vice versa as a  
very fine mechanical means  
may be employed to  
vibrate the pens on and off  
the paper the  $\frac{1}{2}$  in of ~~in~~ inch  
such as using a very fine toothed  
wheel for each pen ~~and~~ are  
arranged in such a position  
under the pens that when  
one set was raised by a tooth  
on one wheel the other set

of pens would be in the space  
between two teeth on a small  
wheel & be in contact with  
the chemical paper. This  
wheel being rotated very  
rapidly would alternately raise  
and lower the pens,

It also can be done by a  
Comb of insulating material or  
any metal which does not form a  
oxide which is made visible by  
the ingredients in the chemical  
paper. The comb for ~~4~~ prongs  
of the Comb being vibrated by  
mechanical this





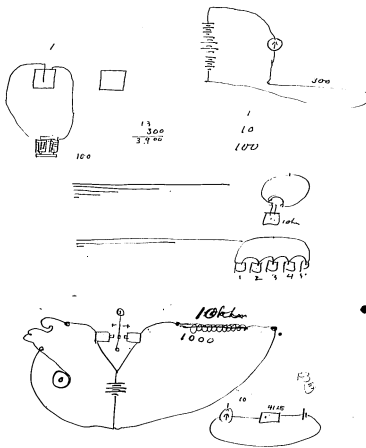
I claim Roman Letters formed ~~of~~ by perforations on continuous strips of paper.

I claim ~~the use of~~ <sup>Combination</sup> a number of punches and dies ~~to~~ <sup>arranged</sup> to perforate Roman letters formed of groups of holes in paper or other material for telegraphic purposes.

a

Caution

#3  
10





144

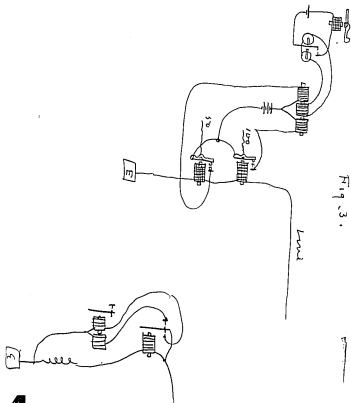
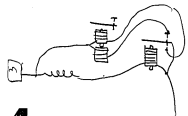
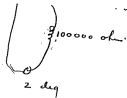


Fig. 3.

144



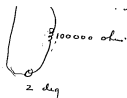
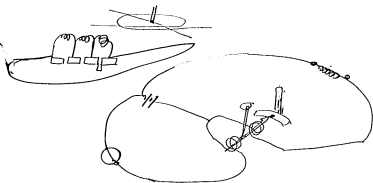
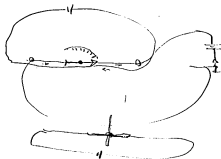
144 (2)



144 (3)

144 (4)

144



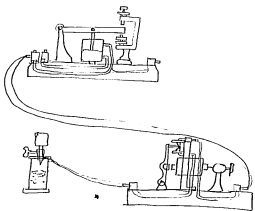
144 ③

144 ④



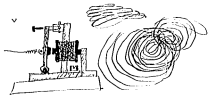


145

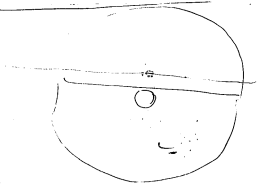


145

MS ①



MS ②

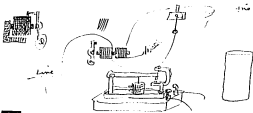


MS ③

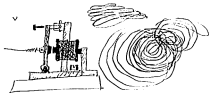
175

The object of this invention is to transmit over a single  
Circuit at high speeds, with the use of a series  
of accumulators or Condensers arranged in  
Succession with ordinary Morse apparatus.

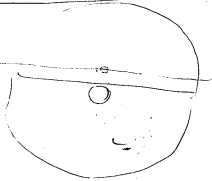
The invention consists of the combination in the  
peculiar arrangement of a number of  
accumulators or Condensers



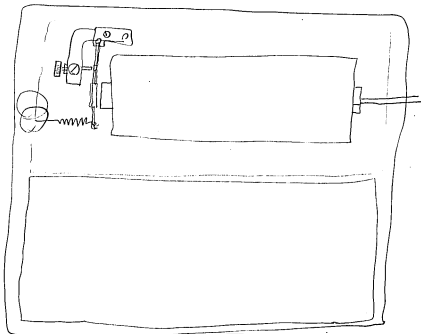
145



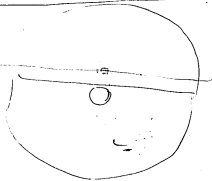
145 B



HS ©



**145**



Mr. Parish.

Please make this suggestion to Mr. Lateman Clark.. all of which if he desires may address my note to The Society of Telegraph Engineers,

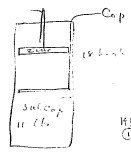
to prevent the diffusion of liquids in a gravity, or a Minotto Battery.

By

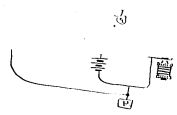
Always place the Sulphate of Copper under the Copper plate instead as heretofore beneath it.

groove & Beckromate may be carried in that manner.

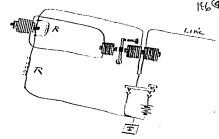
The Sulphate of Copper will never rise above the Copper plate



Patented by me 1871.

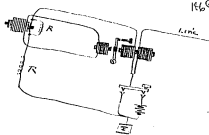
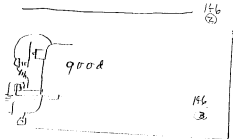
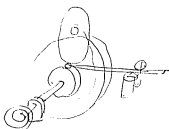
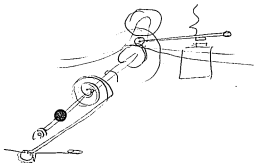
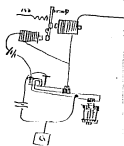


H.C. 3

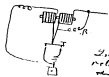
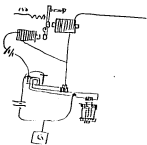


H.C. 4

146

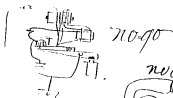


146



not much good

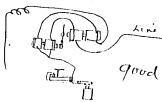
Induction from relay  
retards or prevents  
switch change



no go



no go

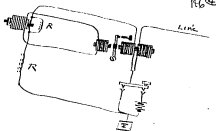
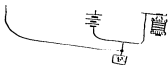


good



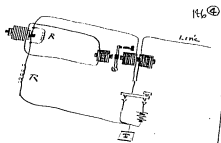
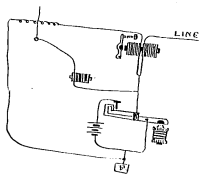
good

H6  
3



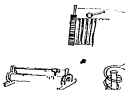
H6

146

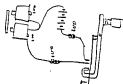


146

147

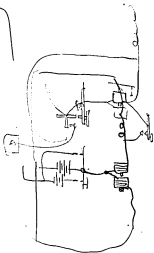


F7  
(1)



F7  
(2)

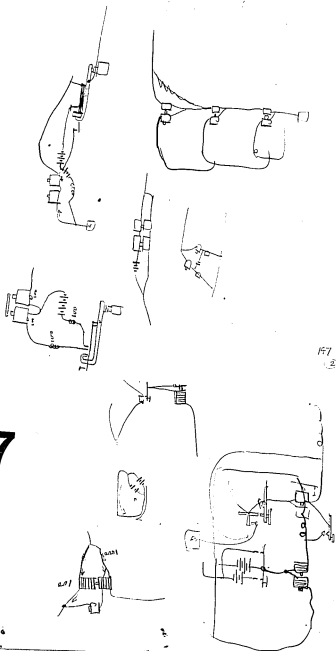
147



F7  
(3)



147



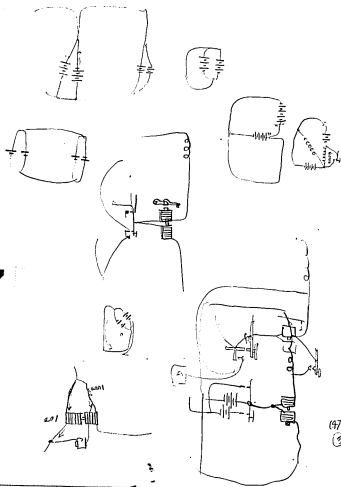
147  
(2)

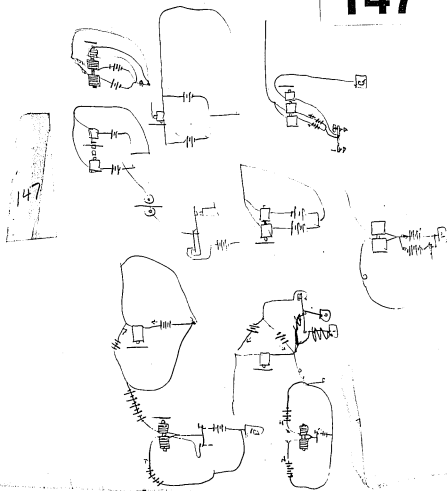
(17)  
(5)

47  
B

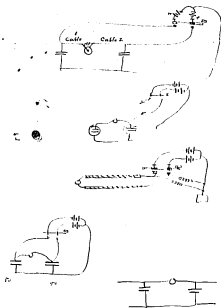
47

147

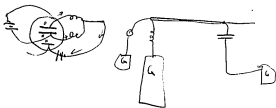




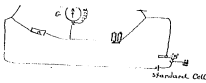
Atlantic Cable  
Two Cable Experiments



138

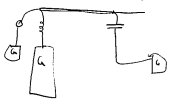
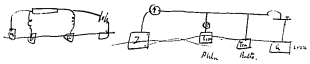
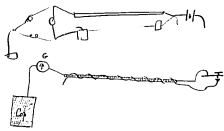
138  
①148  
②

148

148  
③

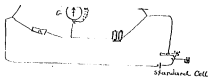
→ a mirror Galvanometer. the current being connected permanently. EMF are balanced. the shunt is then introduced so as to get the reading within reasonable limit. The magnet is placed at least 50 feet from the Galv and the Galv 10 feet from the bridge. The Key is to have a spring closing point, a standard magnet is to be made

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1



148  
②

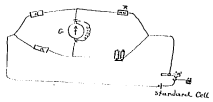
148



148  
③

a mirror-galvanometer, the current being connected permanently.  
 EMF are balanced. The shunt is then introduced so as to  
 get the reading within reasonable limit. The magnet is  
 to be placed at least 50 feet from the Galv and the Galv  
 10 feet from the bridge. The Key is to have a

148

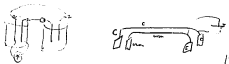
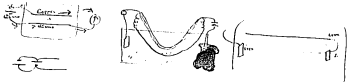
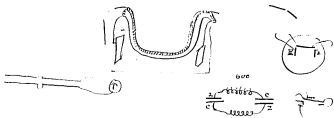
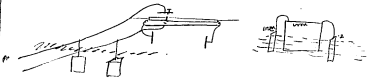


148  
(5)

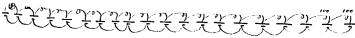
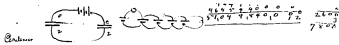
is a mirror-galvanometer. The current being connected permanently. EMF are balanced. The shunt is then introduced so as to take the reading within reasonable limit. The magnet is to be placed at least 50 feet from the Galv and the Galv 10 feet from the bridge. The Key is to have a spring closing point, a standard magnet is to be made.



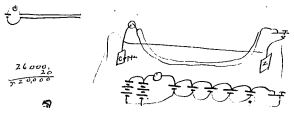
149



199  
3

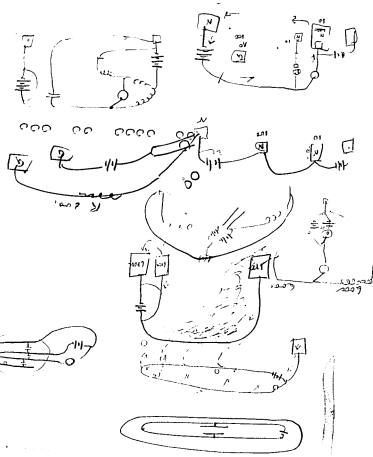


149



199  
3



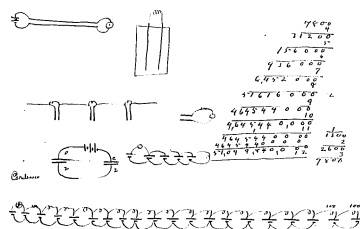
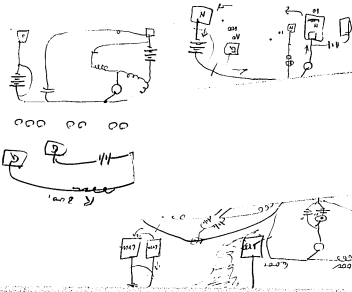


149

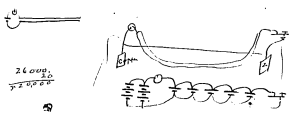


$$\begin{array}{r}
 4500 \\
 21200 \\
 \hline
 156000 \\
 976000 \\
 2452000 \\
 576160000 \\
 469344000 \\
 924344000 \\
 424320000 \\
 424320000
 \end{array}$$

145

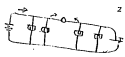
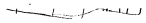
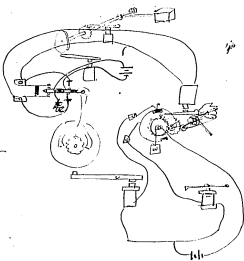


149



19

150



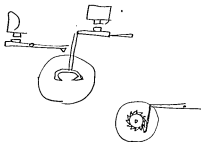
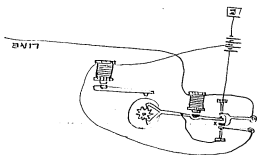
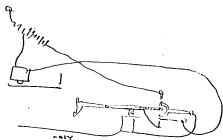
150  
①

150  
②

150

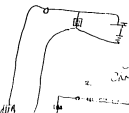


150  
③



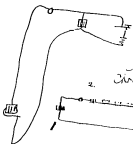
150

150



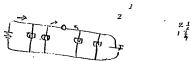
Christmas  
lights  
Christmas

150



Circuit

Circuit

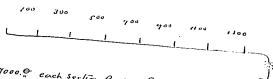


150

(2)

150

(3)



Two  $R = 7000 \Omega$  each section  $R = 1000 \Omega$

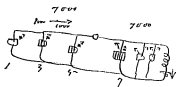
$$\frac{1300}{6} = 216 \text{ with } 130 \text{ against } 1300.$$

$$1300 = 1118 \text{ with } 130 \text{ against}$$

$$1100 = 600 \text{ with}$$



$1112 \rightarrow$

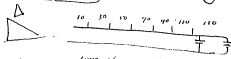
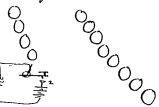
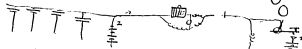
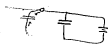
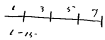
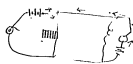


**150**



151

151

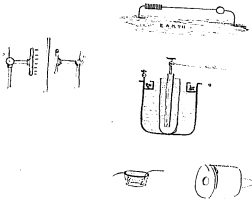






152

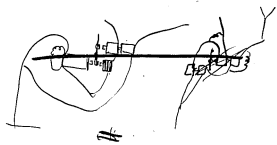
Definition of physics.—as we look around on the universe on which we dwell, we are struck with a variety of objects outside of ourselves and independent of us. Some of these we see, some we touch, others we hear, or taste or smell.



152

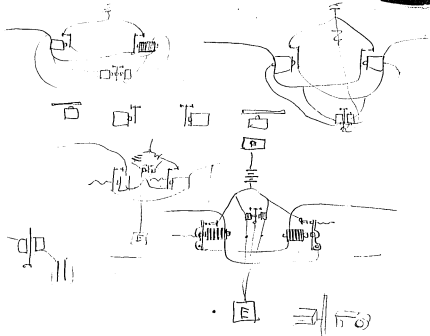
152  
(1)

152  
(2)

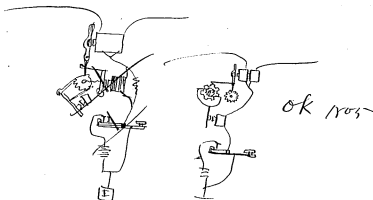


OK C.P.

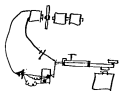
152  
(3)



152



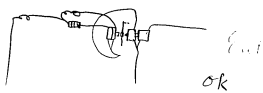
152



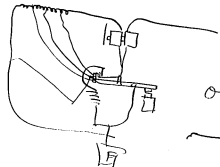
OK No. 6. Ex

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

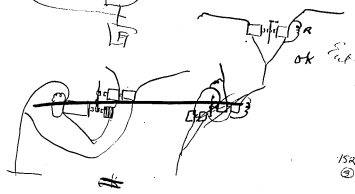
152



Ent  
ok



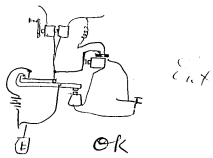
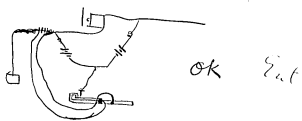
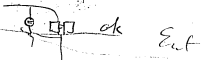
ok



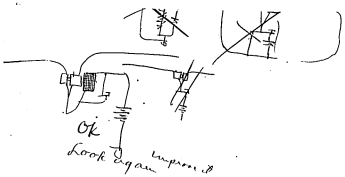
ok Ent

15R  
②

153



153

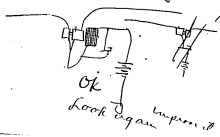
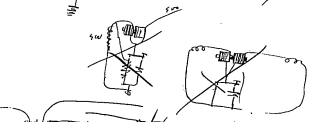
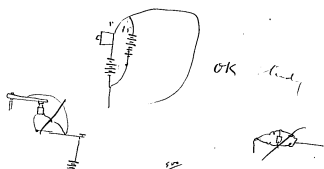
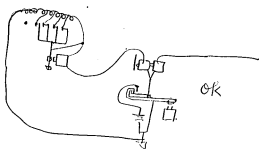


153  
①

153  
②



153



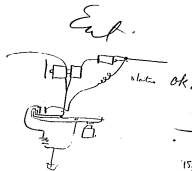
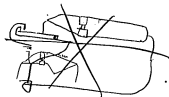
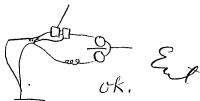
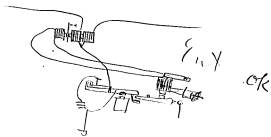
OK  
Look again  
Impressid

153  
②

**153**



153  
②

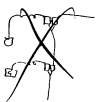
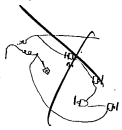


153

154

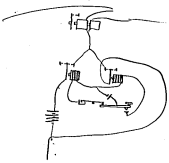


Suggest about Farmer.  
" attorney Phelps Powell



154

154  
①



Combined.

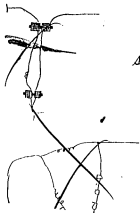
154  
②

No 2

OK

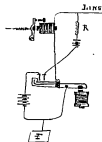
Exp





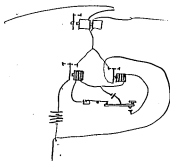
Suggest about Farmer.  
 " attorney Phelps Powell

154



no. 1. Ent

OK



combined.

no 2

OK

Ent

154  
 (5)

310

Newark Feb 10th 1874

Perforator

April 31<sup>st</sup> 1871 Paid Brum's Exp for cutting letters  
 on Key Tuesday June 12<sup>th</sup> 1871 in p. springs  
 tempered in N.Y. City Monday July 17<sup>th</sup> 1871  
 Paid Chat. Rof. 5<sup>00</sup> Express on Perforator to  
 66 Broadway N.Y. City  
 Thursday July 20<sup>th</sup> cleaned Room out fixed  
 Switch Board Friday July 21<sup>st</sup> 1871 Carpet  
 put down and office opened ready for work  
 by us,

J. A. Edison  
 Wm Unger  
 S. J. Murray

To G. Harrington Esq

Room before the Justice of Peace

310 0

**AUTOMATIC TELEGRAPH CO.**  
 President.

TRENTON, N. J. AND WASHINGTON, D. C.

NEW YORK.

69 Broadway.

PHILADELPHIA.

310 Chestnut St.

Baltimore and South St

From Philad

Received at

66 B'WAY

To J. A. Edison Newark

Nov 11 1874

The National Academy of Science Session before  
 Henry Boscawen is now in session at the University  
 of Pennsylvania on the 10th inst. you come on either Tuesday  
 or Thursday and exhibit your remarkable Electric  
 Telegraph to them either by mail

See J. A. Edison  
 and to be sent to Henry Boscawen 10<sup>th</sup> Street Philadelphia

310 0

See Letter page 132.

E-1719

Laboratory Notebook, Cat. 30,099

This notebook contains no dated entries but was probably used between 1872 and 1874. It is entirely by Edison. The first 81 numbered pages list the parts of the universal printer and the machines and tools needed to make them. Pages 100-109 contain similar information for another unnamed instrument. On pages 274-290 are drawings of multiple telegraphy circuits. At the end of the volume, on pages 315-320 (in reverse order), is a description of the chemical telegraph, which may be a rough draft for publication. On pages 305-314 (in reverse order) is a draft for an elementary introduction to electricity and telegraphy to go with sets of simple telegraph apparatus for beginners. The cover is labeled "Universal - Private." The book contains 320 numbered pages.

## Base

Drilling Jig. Top.

Tapping Jig

Drilling Jig side.

Planing plate or jig

Receiving Jig or Gauge

Drills. Runners. Taps. Plugs.

face mills.

Test Gauges.

Under Key Guide.

3



Drilling Jig.

Receiving Gauge.

Mills.

Rammers. Drills, Plugs.

[LEFT PAGES ARE BLANK]

Center piece

5

Center Peice Bridge

Receiving gauge.

Mills. Jaws.

Drilling Jig.

Tapping Jig.

Drills runners. Taps. plugs.



Intermediate Holder

9

Receiving Gauge.

Mills, Saws & fixtures

Drilling Rig

Taping Rig

Swap gauge

Inspection Gauge.

Drills Taps Rymen. Plugs.





[LEFT PAGES ARE BLANK]

Starley Rod post.

11



[LEFT PAGES ARE BLANK]

Switek,

13



[LEFT PAGES ARE BLANK]

Gear wheels:

15

[LEFT PAGES ARE BLANK]

Main break wheel.

17

[LEFT PAGES ARE BLANK]

Rubber for Main break spring

19

Main break spring,

21

Pandistic,

de for hole,

Bending Die,

Slething,

Receiving gauge,

Stop pin piece.

23



Collar.

Screw machine tools

Rymer.

Drill jig

Tapping jig

snap gauge.

Inspection gauge.

Receiving gauge.

Taps Drill plugs.

pins

Assembling gauge

Receiving gauge After assembling

[LEFT PAGES ARE BLANK]

Centers for gears.

25



[LEFT PAGES ARE BLANK]

Center Service for Gears.

27

Key Knobs.

29

Former.

Drill.

Plug.

Snap Gauge

Inspector's Gauge

Receiving Gauge.

[LEFT PAGES ARE BLANK]

Keys. Round part

31



[LEFT PAGES ARE BLANK]

Key Plat past

33

Long

[LEFT PAGES ARE BLANK]

Switch points.

35

[LEFT PAGES ARE BLANK]

State of

37

State of

ENGINE.

Milling fixture

Mills

Drilling jig

Tapping jig

snap gauge.

Inspection Gauge.

Receiving gauge

Rymers.

Taps, Drills, plugs

Counter boxes.



[LEFT PAGES ARE BLANK]

Magnet bottoms.

Punches Etc.

Mills, Saws

Snap gauges

Inspector's Gauge.

Drill jig.

Countersinks

Receiving gauge

Drill. Runners plugs

Magnet cores:

45

Receiving gauge

Snap gauge

Inspectors Gauge

Capping jig.

Yokes.

Mills, Jaws.

Drilling jig.

Countersink

Receiving Gauge

Snap gauge

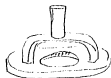
Inspectors Gauge.

Drills, reamers, plugs.

Engine shaft guide

47

Milling fixture  
Mills.  
Drilling gauge.  
Receiving gauge.  
Snap gauge  
Inspection Gauge  
Drills, reamers, plugs.  
Counter bore.



Engine break wheel.

49

Former.

Drill jig

Tapping jig.

snap gauge.

Inspectors Gauge.

Receiving gauge

Drills reamers, taps, plugs.

Cutters, Mandrels.



Engine break wheel springs

51

Nº1.

Punch and die.

" do hole

Bending Die

Receiving gauge

Nº2

Punch & Die

do hole

Bending Die

Receiving Gauge

Engine shaft.

53



Former for acorn.

Snap gauge.

Inspector's Gauge

Center gauge

Receiving Gauge.

[LEFT PAGES ARE BLANK]

Center for Engine shaft.

55

0

Receiving Gauge.

Snap gauge

Inspection Gauge

Screw Book.

Ratchet wheel starter. sleeves

57

Former.

Drill, ramer. plug. Taps.

Drill jig

Tapping jig

Receiving gauge

Snap gauge

Inspection Gauge



[LEFT PAGES ARE BLANK]

Ratchet

59

[LEFT PAGES ARE BLANK]

Tension collar

61



Hex key

Drill jig

Tapping jig

Receiving gauge

Snap gauge

Inspection gauge

Runover, Drills, Taps, plug.

[LEFT PAGES ARE BLANK]

Revolving armature collar.

68



Revolving armature.

65

Mills  
Drilling jig  
snap gauge  
Inspection Gauge  
Receiving gauge  
Rymer Drill. plug.  
Punch  $\frac{1}{16}$  die.

Goumer Cross head

67



Upper.

Punch & Die.  
Milling fixture  
Mills,  
Snap gauges  
Inspector's Gauge  
Receiving gauge  
Drill jig  
Tapping jig.  
Setting fixture.  
cutters.  
Plug, Drill Rymmer taps

Lower.

same.  
Rymmer  
Plug.  
Drill.

Link

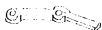
69



Punch & Die.  
Mills.  
Drilling jig  
Snap gauge  
Inspection Gauge  
Receiving "  
Countersink & fixture  
Drills Rymer plugs.

Arm.

71



Punch Die.

Mills.

if milling jig. ... combination with Link.

Snap gauge.

Inspection Gauge.

Receiving gauge.

Countersink fixture.

Drills, reamers, Pins.

Goussier Sleeves.

73

Sleeves.

Screw Jacks.



Rymes.

Plug

Swap Gauge.

Inspection Gauge

Receiving Gauge. - when collar on

Drills.

Ring.

Screw Jack

Rymes.

Forming fixture

Swap gauge

Inspection gauge

Plug.



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Governer Ball

75

Seven machine tools

[LEFT PAGES ARE BLANK]

Regulating pin guide.

77



[LEFT PAGES ARE BLANK]

Regulating pins

79

Rubber insulation

[LEFT PAGES ARE BLANK]

Rubber insulation for binding posts

81

100

Instrument.

Drilling jig. also countersere

Tapping jig

Receiving Gauge

Snap Gauge

Inspector's Gauge

Turning . . . . .

Counterseres

Runers.

Drills

Plugs.

Countersinks

Base legs.

103

Screw<sup>M</sup> Tools

Tap.

Drill.

Snap gauge

Inspectors Gauge.

Receiving Gauge: mixing

[LEFT PAGES ARE BLANK]

Vibrating point post.

105

Washer.

Platina



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Maquet slide pins

107

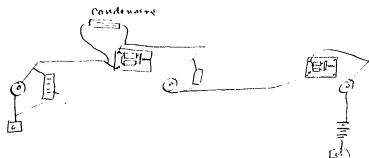
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Maquet slides.

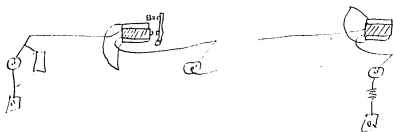
109

No 1

No 2



The use of the condensator attached to the several relays in the line of a Chemical Telegraph so that their inductive action will not interfere so much with the proper reception of the signals



The addition of a secondary coil to the relay spools so that the induction action will be thrown into this coil and prevented from going upon the line.

The Employment of low resistance relays upon lines using Chemical telegraphy system to prevent too great an induction action which would be the case of high resistance coils were used - having a large amount of fine wire upon them. The employment of a number of relays arranged thus

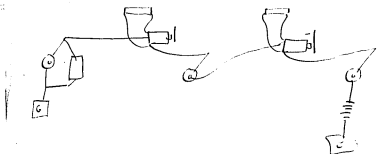


The relay in this case working opposite to the ordinary, the armature flying away from the force of the Cores when the main current is closed by and closing the secondary battery upon the back point. The spools of the relay are double

in the outer spools there circulates a constant local current its strength graduated by an adjustable resistance box so that more or less current may be made to enter the holes, the inner coil is that of the main line and the direction of the main line current and local current is such one being in one direction & one in the other & that by properly adjusting the local current they exactly neutralize each other, so that when the main line is open the local current in the outer coils draws the armature towards the cores and opens the circuit of the sounder but when the main line is closed the two currents neutralize each other and no magnetic effect is had upon the cores consequently the spiral adjusting spring pulls the armature & leaves away from the magnet and brings the two contact points together closing the local circuit. Now in this case we have a good relay also in the other case but its inductive action is reversed. Consequently when the main line is closed the relay by reason of closing its magnetism generates a current with in the same direction as the line current

and when the line current ceases  
 generate a current in the line in  
 the opposite direction to the main  
 current thus reversing the phenomena  
 of the Relay inductive current and  
 adding to the legibility of the  
 signals

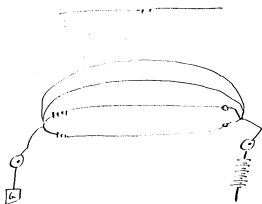
Increase the efficiency of induction coil  
 by putting a keeper from pole to pole.



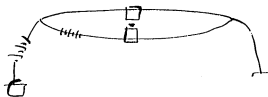
Shunt or Short circuit the relays of a  
 line <sup>to avoid telegraph</sup> by a plain reed so  
 that the inductive discharge will  
 not interfere with the main current  
 it being thrown into the Short  
 circuit & eliminated =

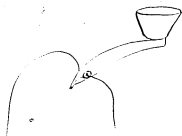
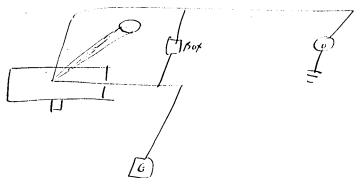
I decrease the inductive discharge  
 of a relay by making the Core  
 very short and cutting a longitudinal  
 slot in their Core so that the

Circulation of the residual  
magnetism to be stopped by the  
slot.



Plan for obtaining an extra wire  
from several circuits there  
being no time when all are open





I employ a tube with accumulated water  
 or that compound which will give oxygen  
 the fastest with a small amount of  
 current the oxygen at the moment of  
 its liberation puff out upon the  
 Chemman's paper + set the cadmium  
 free leaving a mark the object



of performing the decomposition by first  
making oxygen & allowing it to do the  
work so that the resistance of the  
acidulated water is very much  
greater than the paper tubes & generally  
a smaller amount of current will  
do the work an important thing  
you long lines where but 2. 12. 2.  
current reaches the dist at end

This instrument is the same as used upon short  
lines of telegraphs by the great telegraph Company  
with the exception that it is somewhat <sup>restored in size</sup>  
"The apparatus on the left containing the seven  
+ magnet is called the "Indicator" the  
dots and dashes being read by the position  
of the pen which the lever makes when the  
magnet is operated the apparatus on the  
right is called the "Key" and is used  
to open and close the electric circuit  
circuit or in other words to stop and start  
the electricity over the wires.

The two brass standards for holding the  
wires are called Biting posts.

The little porcelain cups are the batteries which  
generate the electric city.

These instruments being <sup>made</sup> precisely like the ordinary  
morse instrument persons <sup>new</sup> to <sup>using</sup> them  
will learn more readily upon them than upon  
~~some of the machines now offering~~ which do

Not preserve their features in combination

For the benefit of young persons who may purchase the instrument and who might desire to understand the principle of a magnet.

Battery and their combination together to form a telegraph I give below a brief sketch which I ~~hope~~<sup>think</sup> will be comprehended by the youngest minds.

#### Magnet

Iron becomes magnetic when a current of electricity passes near it. If we take ~~into~~ <sup>a</sup> large ~~nail~~ 10 feet of Copper wire and carefully wrap cloth or paper around it and wind it around a large nail so that no part of the wire or copper will touch any other part (the paper or cloth being used to prevent) and then ~~join~~

touch the two ends of the wire to the two ends of a battery, the iron <sup>nail</sup> becomes magnetic because the electricity circulates around it.

The nail will draw to its face pin tacks and other light iron pieces of iron. If we have one cup of battery it may lift a tack of 2 cups a shingle nail and so on as we add battery. The nail will continue to lift more iron up to a certain limit.

If twenty feet of wire is used one cup will make the nail lift more than if it had only 10 feet and that ~~power~~ by adding to the length of the wire we get more strength or magnetism in the nail, but this ceases at a certain limit.

Just the right length size and kind of wire and number of cups of battery to be used can be found by experimenting the easiest method is to start with it.



This little whalebone instrument may be  
used to record upon a piece of paper in  
the way, if to the extreme end of the whalebone  
is tied a lead pencil hanging downwards  
the marking end nearly touching the board  
and a piece of paper be fast. between it  
to the board & pulled all along ~~to~~ slowly  
by hand while the magnet is working the  
End of the pencil will be brought down  
upon the paper every time the ~~key is closed~~  
wire on the unit is attracted to the duct,  
and will be drawn away from it when  
it is taken off. so that if the binding is  
connected but an instant the pencil will  
touch the paper but an instant and make  
a dot and if the <sup>resting</sup> battery is allowed to stay  
on a little longer the pencil is held down  
on the paper longer & we have a long  
mark called a dash or dot and a dash  
forming the little d.

~~In some telegraph offices some recording  
machines are still used, but they are  
fast going out of use. The recording machines  
are not so generally used as the sounder  
most of the despatches being read by the  
sound of the lever instead of being read  
from the paper.~~

The battery may be three miles away from the nail and the wire which are wound around it carried over horses & trees to the battery. The effect would be the same upon the nail when the two ends were connected to the battery. The electricity would go over <sup>the wire</sup> ~~the~~ three miles of wire run around the wire on the nail and return back to the battery again by the other wire.

~~We will now show~~

Battery.

If we ~~of~~ ~~wire~~ ~~are~~ ~~wanted~~ the action of zinc may be shown by taking another nail arrange it the same as the one just described and take one of the ends of the wire of ~~one~~ the first nail and wind a lot of it around the second nail and then to the battery, so that when the battery is put on both nails will become magnets. 34 or a doz nails may be included in the same circuit.

Now the sounder represents the whole line machine and the key represents a convenient apparatus for communicating with the battery.

Battery.

~~Now~~ I will <sup>now</sup> explain the action of a battery by ~~the way~~ take a common tumbler get a piece of zinc cut a piece of sheet zinc from that and under show the a piece of ~~some~~ copper wire to it and place it on one side of the tumbler which must be 018

nearly filled with water, now tie another  
 piece of copper wire around a big Copper Cent  
 and hang in on the other side of the bucket  
 in the water, if the wire on the zinc is touched  
 to the wire on the cent we get ~~no~~ no current  
 but if a little blue stone or blue vitriol which can  
 be bought at the drug store for very cheaply  
~~is added~~ is powdered finely by a hammer and  
 thrown into the tumbler the water quickly  
 becomes blue and by touching the two  
 wires together ~~is~~ a current of electricity  
 passes from the zinc through the blue water  
 to the copper thence through the wire back  
 to the zinc, to obtain electricity it being  
 necessary to generate a ~~small~~ metal wire from  
 the zinc copper back to the zinc so matter  
 how long the wire may be one mile or  
 one thousand which connect the copper  
 with the zinc the current will leave one end  
 of the battery and come back to the other  
 end of the wire is very short a large amount  
 of electricity will pass through it but if  
 long a lesser amount.

Blue Vitriol ~~is composed~~ or Sulphate of Copper is made  
 of sulphuric acid and metallic copper so that  
 when it is thrown in the water where the zinc  
 and copper is, the sulphuric acid leaves the  
 copper and attacks ~~the~~ <sup>the</sup> zinc  
 forming a new article called sulphate of zinc  
 it being a great liking for zinc than  
 copper, the copper which the sulphuric acid  
 drops to sleep for itself goes over to the  
 Copper Cent and sticks to it.

It is the destruction of the zinc by the eating  
action of the Sulphuric acid that generates  
makes the electricity.

Common the Sulphate of Copper may be  
dispensed with and Common salt used,  
in fact nearly anything that will eat the  
zinc and not the copper will generate  
electricity and make a battery.

If we desire a stronger or more intense  
battery we must use two lemnibles

precisely alike the zinc of one lemnible  
being connected to the copper of the  
other by a wire, if several then the  
zinc of one cup must be connected to  
the copper of the next - so that the  
last cup on each end of the battery  
one shall be zinc & the other copper  
if copper & copper & zinc & zinc were  
connected we should get no current  
as we would send a current one  
way & the other another way & the zinc  
would ~~be opposed to the other~~ just

like trying to pull a wagon two  
ways opposite directions at the same time.

The Battery which accompanies this  
instrument is of similar to that

used as an illustration of the principle  
in which a battery works.

The Blue stone consisting of small pieces  
about the size of a marble is packed

Closely in the hollow of the jar  
on top of this is laid a round piece  
of Copper with a wire connected to it  
then Sandrust is put on top of this  
and a round piece of zinc with a  
wire on it on top of the Sandrust  
The reason why the Sandrust is used  
is that it prevents the zinc from  
touching the Copper and also prevents  
the blue stone water from rising up to the  
zinc the battery not lasting so long when it  
does run. By pouring in water nearly to the  
top and connecting the Cells together  
~~by itself~~ and pulling the zinc wire to the  
Copper wire for several hours the battery  
will in that time be strong enough to  
use, its action may be quickened by  
pulling low transparent of Sulphate of  
zinc in the water, when the blue vitriol becomes  
exhausted and the battery does not generate  
electricity, it should be taken apart and cleaned  
~~with~~ a fresh supply of <sup>the</sup> vitriol be added &  
clean sandrust & fresh water.

### Running Wires

When the two or more instruments are to  
be used upon the same circuit in the  
same house the shoud be connected as  
shown in the Diagram No 2



Where the line is several extends out in the open air for any length, two wires are not necessary, as the earth can be used for the second wire, instead of running a second wire it can be tied to the water or gas pipe the place where it is tied being cleaned by a file or knife so that the metal of the water or gas pipe is bright, - should there be no gas or water pipe in the house then tie the end of the wire to a number of pieces of scrap iron or old iron dug a hole in the ground in a wet place 2 or 3 feet deep and throw in 4" iron rods into the well, (be careful not to put it in a cistern) or if you have a lightning rod tie it to that of course this must be done at both ends of the line, Diagram No 2 will show the connection. The line wire should be of copper the size shown in ~~fig~~ Diagram No 3, and may be purchased at the tin smith, if a smaller size is used more battery will be necessary. Iron wire can be used but to obtain as good results it should be three times as large as the copper.

The suspended wire must be insulated and must touch nothing but glass, a large nail driven in with a small cast iron ball set on it will ~~be a~~ make a good insulator the ball being obtained at the drug store very cheap.

If the wire touches the wood or anything else which is not an

insulation very damp weather would  
interfere with the working of your line  
the current leaking out of the wire  
down into the ground.

The longer the line the greater amount  
of number of dips must be used  
also the more insulators the more  
to allow.

~~From the same~~ the battery should  
be kept at one station.

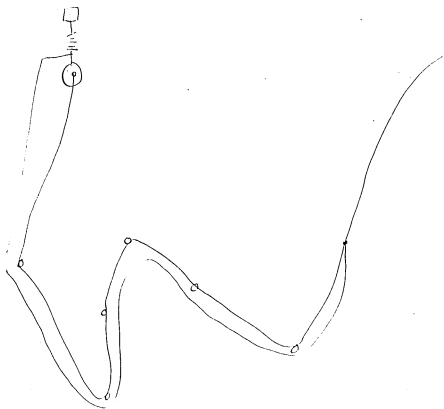
(When several <sup>houses</sup> ~~houses~~ wish to  
connect their houses together Diagram  
11 & 4 will give you the manner of  
connecting them

although this is the most convenient way and  
less liable to derangement the battery may  
be divided up some being included in  
the circuit at each of the stations



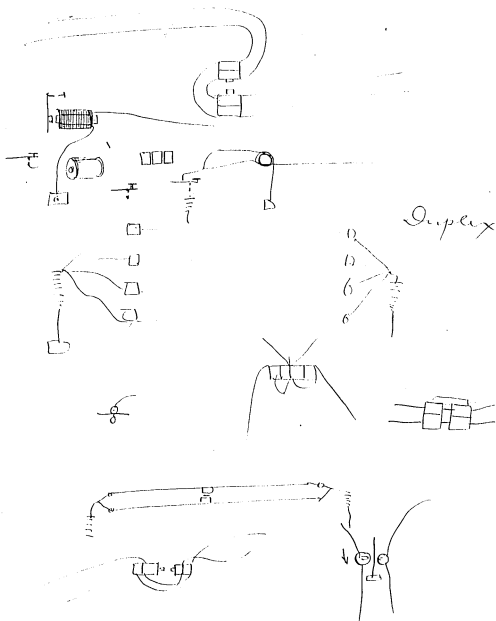
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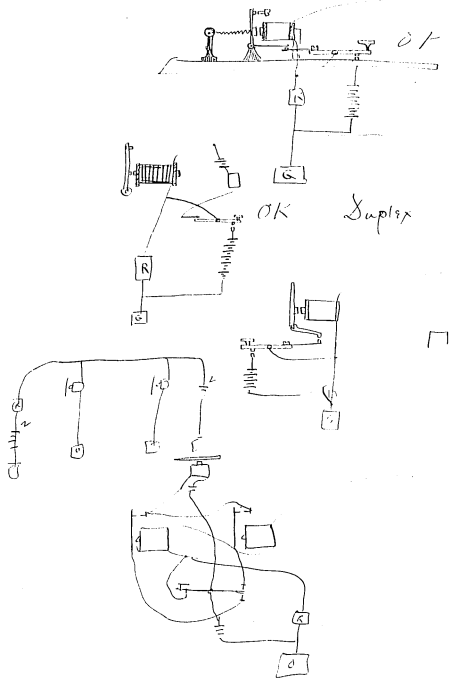
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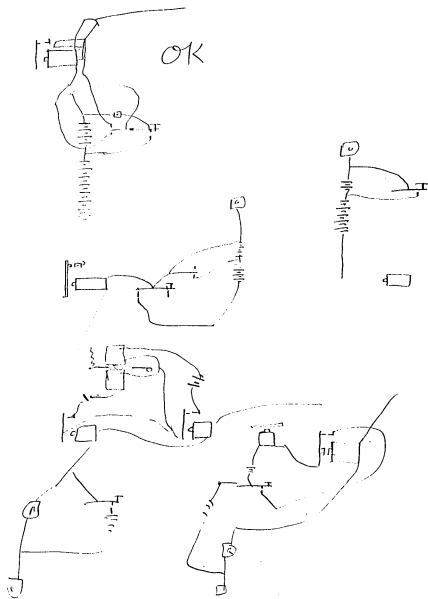
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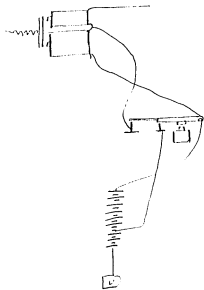


Duplex



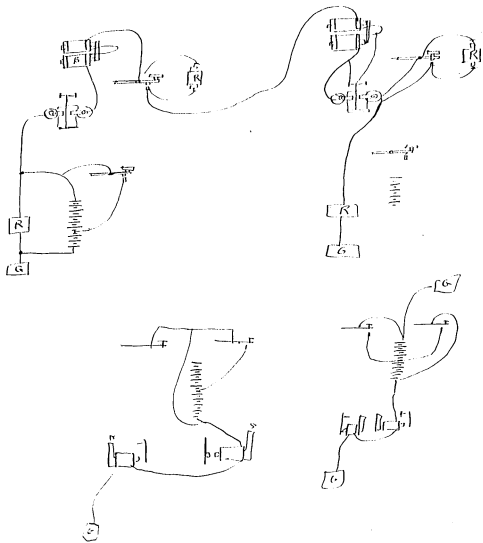
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*Diode*

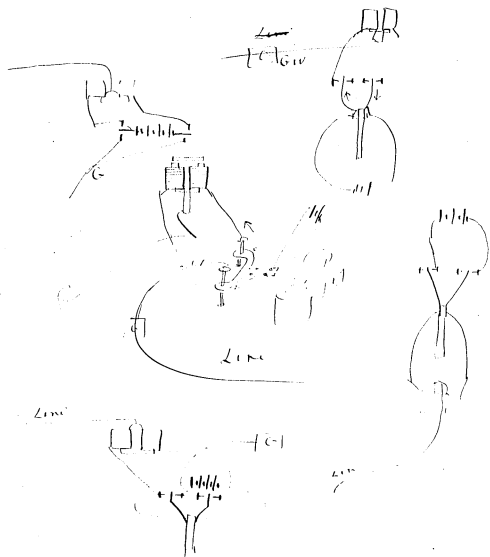


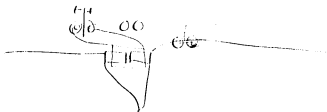
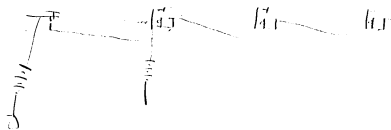
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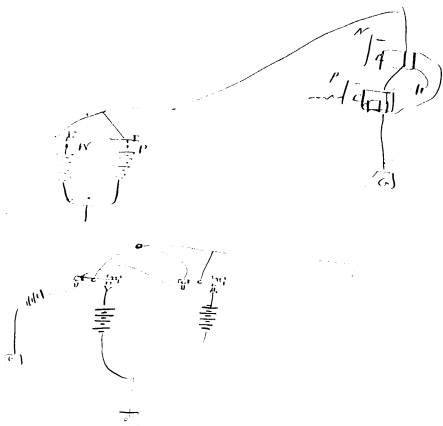
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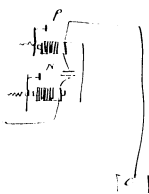
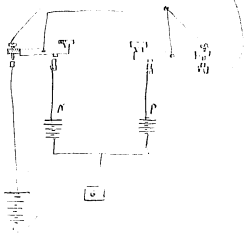


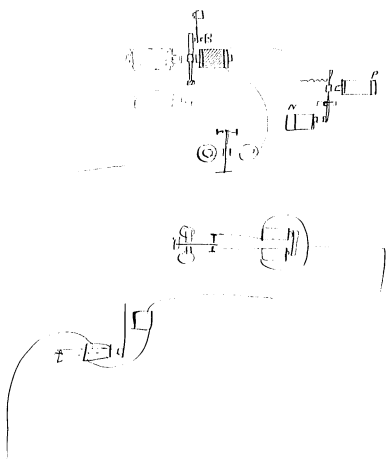
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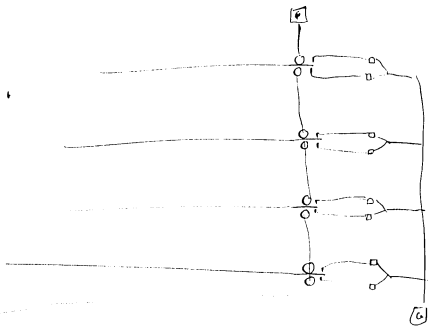


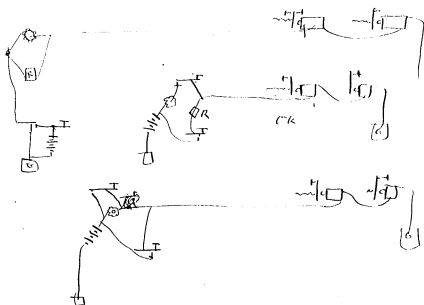
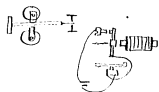












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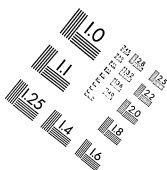
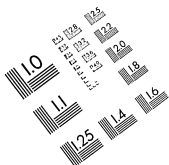
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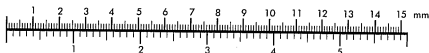


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